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ABSTRACT

In an archival study, the academic outcomes of 653 students with disabilities and 41,357 students without disabilities attending Dawson College (Quebec) were compared over a 12-year period (1990-2002). Students with disabilities were more likely to have been enrolled in a pre-university program, less likely to enroll in a continuing education program, were on average a year younger than the general college population, and entered Dawson with lower high school averages. Results indicate that students with both physical and learning disabilities had graduation rates that were virtually identical to those of non-disabled students, although students with disabilities took approximately one semester longer to graduate. When average grades and course pass rates were examined, students with disabilities generally did at least as well as, and in some cases significantly better than, their non-disabled peers. The overall trend for grades and course pass rates was for students with learning disabilities/attention deficit disorder to have similar or slightly poorer outcomes than the non-disabled sample, and for students with all other disabilities to have slightly superior outcomes. Males, both disabled and non-disabled, had poorer results than females with respect to all indicators. Four appendices provide methodology details. (Contains 115 references and 24 tables.) (DB)

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Students With Disabilities At Dawson College: Success And Outcomes
Étudiants ayant des handicaps au Collège Dawson : réussite et avenir

ED 481 553

Adaptech Research Network - Dawson College
Réseau de Recherche Adaptech - Collège Dawson

Final Report Presented to PAREA
Rapport final présenté à PAREA
Spring / Printemps 2003

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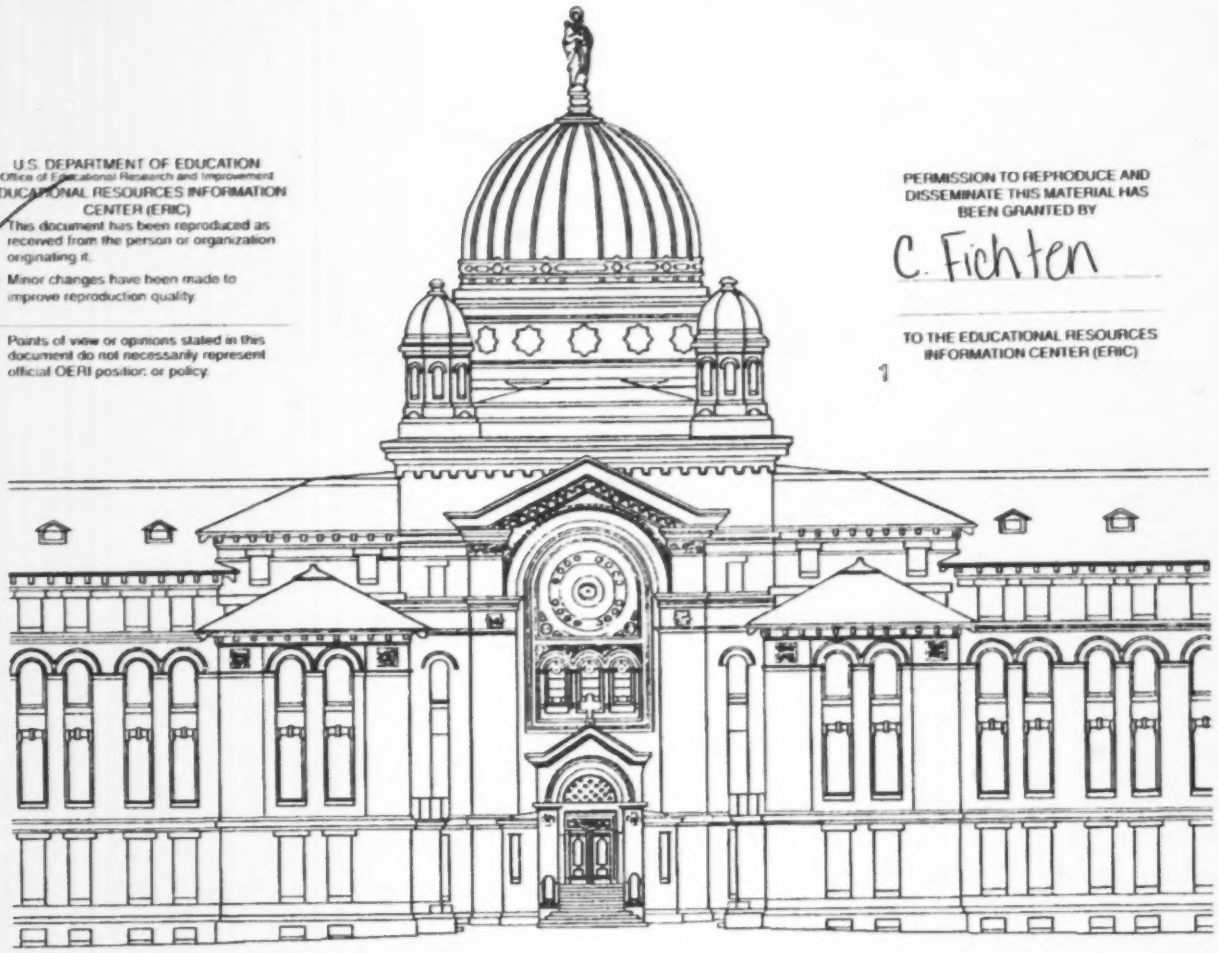

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Executive Summary - Students With Disabilities At Dawson College: Success And Outcomes

Final Report Presented to PAREA
Spring, 2003

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Executive Summary

Abstract

In an archival study the academic outcomes of 653 Dawson College students with and 41,357 without disabilities were compared over a 12 year period starting in 1990 and ending in 2002. Results indicate that students with both physical and learning disabilities had graduation rates that were virtually identical to those of non-disabled students, although students with disabilities took approximately one semester longer to graduate. When average grades and course pass rates were examined, students with disabilities generally did at least as well, and in some cases significantly better than their non-disabled peers. The overall trend for grades and course pass rates was for students with learning disabilities/attention deficit disorder (ADD) to have similar or slightly poorer outcomes than the non-disabled sample, and for students with all other disabilities to have slightly superior outcomes. Males had poorer results than females with respect to all indicators. This was true for students both with and without disabilities.

Preamble

The academic outcomes of 653 students who made a request for disability related services at Dawson College (students with disabilities) were compared to those of 41,357 students who did not make a request for services (non-disabled students).

Dawson College is a junior / community college (public cegep) located in downtown Montreal. It offers diplomas (DEC: Diplôme d'études collégiales) in two year pre-university programs (pre-university sector – courses of study such as health science and social science) and three-year career programs (courses of study such as nursing and mechanical technology). It also offers preparatory sessions as well as continuing education courses.

To be included in the study, students (1) must have enrolled at Dawson College for the first time between the autumn session of 1990 and the winter session of 2002, and (2) must have had no prior history of having studied at a cegep. Of the 722 disabilities recorded for the 653 students (some students had more than one disability), 52.6% (380) were learning disabilities and/or attention deficit disorder (ADD) and 47.4% (342) were other disabilities such as visual, hearing, speech, orthopedic, psychiatric and medical impairments.

Four outcome measures were examined: graduation rates, average grades in the first semester, course pass rates (percent of courses taken that were passed), and course success rates (percentage of students who passed 100% of the courses they undertook in the first semester).

Characteristics of The Samples

When students with and without disabilities were compared, it was found that a higher proportion of students with disabilities were enrolled in pre-university programs (72.7% vs 60.8%) and a lower proportion in continuing education (8.3% vs 22.1%). The proportion enrolled in careers programs was the same for both groups (11.3%). The remaining students from both groups were enrolled in preparatory sessions. The difference in the proportions of students enrolled across sectors was statistically significant. The majority of students from both groups were enrolled in the pre-university social science program.

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The group of students with disabilities were, on average, about a year younger (19.4 vs 20.5) and a greater proportion of them were aged 19 or under (77.3% vs 72.2%) when they first entered Dawson College. This age difference is due primarily to the larger proportion of older non-disabled students registered in continuing education courses. The mean age for students both with and without disabilities in careers programs was 19.3 years. The mean for students with disabilities in pre-university programs was 18.7 years while those for students with no disabilities it was 18.3 years.

Other differences include: (1) a larger proportion of the sample of students with disabilities was male, had English as their mother tongue, and were born in Canada or the USA than was the case for the non-disabled sample; (2) students with disabilities tended to enter Dawson College with lower Secondary V (high school leaving certificate) averages. These differences were statistically significant.

Graduation Rates

Graduation rates were calculated for students enrolled full-time in diploma programs. The sample was finalized in May, at the end of the 2002 winter session. This allowed all students included in the sample at least two additional years beyond the minimum time required to complete their diplomas. Therefore, only students who commenced in two-year pre-university programs between 1990 and 1998 or in three-year career programs between 1990 and 1997 were included in analyses of graduation rates. This resulted in a sample of 316 students with various physical, sensory and learning disabilities and 18,747 students with no disabilities.

Two-year pre-university programs. Of the 269 students with all types of disabilities who commenced in two-year pre-university programs between 1990 and 1998, 55.0% had graduated (or were eligible to graduate) by the end of May 2002. During the same period, 54.5% of the 16,053 non-disabled students had graduated or were eligible to do so. The difference was not significant. When the pre-university sample was divided into those with disabilities other than learning disabilities (including multiple impairments) (N=123), and those with learning disabilities and/or ADD (N=146), the graduation rates were 54.5% and 55.5%, respectively. Again, the difference was not significant.

Three-year career programs. Similarly, of the 47 students with disabilities who commenced in three-year career programs between 1990 and 1997, 53.2% had graduated or were eligible to do so by the end of May 2002. The rate for the 2694 non-disabled students during the same period was 51.7%. The difference was not significant.

Time taken to graduate. As expected, students with disabilities took slightly longer to graduate than their non-disabled peers. For the 9 pre-university cohorts who commenced between 1990 and 1998, students with disabilities took, on average, 6.0 semesters to graduate. Non-disabled students took, on average, 5.2 semesters. For the 8 career program cohorts commencing between 1990 and 1997, the time taken to graduate was 8.2 semesters for students with disabilities and 6.9 semesters for the non-disabled students. These differences, which could be attributed to the fact that students with disabilities, on average, took lighter course loads, were statistically significant. Thus, there was approximately a one-semester difference for both two-year pre-university and three-year career programs.

Average First Semester Grades

Two sets of analyses were carried out. Average first semester grades were calculated for all students including those in continuing education, for the total period between 1990 and 2002. This includes grades for students who commenced in the winter session. To allow for comparisons of students enrolled in the same program, we also analyzed grades for the subgroup of students who were enrolled in the Social Science program. This is the program where the majority of both samples of students were registered. Because course requirements for these students are the same, differences due to discrepancies in field of study should not influence the results.

All students. When the average first semester grades of the 632 students with disabilities were compared to those of the 40,262 non-disabled students, there was no statistically significant difference between the two groups (66.3% vs 65.9%, respectively).

The first semester grade averages of males tended to be lower than that of females for both groups of students. When males with and without a disability were compared for all programs there was no significant difference (63.3% vs 63.2%, respectively). There was also no significant difference between females with and without a disability for all programs (69.4% vs 68.3%, respectively). However, when corrected for Secondary V averages, both males and females with disabilities performed significantly better than expected when compared to their male and female non-disabled counterparts.

When the average of the first semester grades of 347 students with a learning disability/ADD were compared to the average grades of 285 students with all other disabilities, the average was significantly lower for those who had learning disabilities/ADD (63.7% vs 69.5%). When grades of students with learning disabilities/ADD were compared to grades of non-disabled students (63.7% vs 65.9%), the difference was not significant.

Grades in Social Science. When grades in the Social Science program were examined, students with disabilities (N=269) had significantly higher grade averages than their non-disabled peers (N=13,908), even when the Secondary V average was not taken into consideration as a covariate (66.0% vs 62.3%).

Females with disabilities in Social Science had averages that were significantly higher than their non-disabled peers, whether or not a correction was made for the Secondary V average (70.9% vs 65.6%). Males with disabilities also had significantly higher average grades compared to their non-disabled counterparts (62.7% vs 58.7%), and performed better than would have been predicted by their incoming average.

When grades of students with learning disabilities/ADD were compared to the average grades of non-disabled students in Social Science (63.6% vs 62.3% respectively) the difference was not significant.

Course Pass Rates

All students. Of 3,385 grades for students with disabilities, 81.2% were passing grades. This compares to a pass rate of 80.5% for the non-disabled group. The difference was not significant. The pass rate of students with learning disabilities (78.3%), however, was significantly lower than that of both non-disabled students (80.5%) as well as students with all other disabilities (85.1%).

Social Science. The difference in course pass rates in the Social Science program, however, show that students with disabilities, in general, had a significantly higher pass rate than non-disabled students (80.5% vs 76.6%). The pass rate for students with learning disabilities/ADD (77.4%) was not significantly different from the pass rate for non-disabled students, although it is significantly worse that the pass rate for students with other disabilities (86.0%).

Course Success

The proportion of students enrolled in full-time diploma (DEC) programs who passed 100% of their first semester courses was evaluated for all programs and Social Science.

All programs. There was no significant difference between students with and without disabilities (49.2% vs 49.4%, respectively). There was a significant difference for students with learning disabilities/ADD compared to the group with all other disabilities (43.4% vs 57.1%) as well as with the non-disabled group, with students with learning disabilities having lower course success rates.

Social Science. The course success rate for students with disabilities was significantly higher than that on non-disabled students (48.1% vs 41.4%). The success rate for students with learning disabilities/ADD (41.6%), however, was not significantly different from that for non-disabled students (41.4%), although it was significantly worse than the rate for students with other disabilities (58.8%).

Summary

The findings indicate that students with disabilities at Dawson College had graduation outcomes that were virtually identical to those of non-disabled students. The main difference was that students with disabilities took, on average, approximately one semester longer to graduate. When average grades were examined, students with disabilities did at least as well as, and in some cases significantly better, than their non-disabled peers. When students with disabilities were divided into two groups, students with learning disabilities/ADD and students with all other disabilities, the overall trend was for students with learning disabilities/ADD to have similar or slightly poorer academic outcomes than the non-disabled sample, and for students with all other disabilities to have slightly superior outcomes. Males had poorer results than females on all indicators. This was true for both students with and without disabilities.

Implications

What do these findings mean for the cegep system and Québec society? Should students with disabilities be encouraged to attend postsecondary education? Are funds spent on supporting them in college well spent? Absolutely!

Contact Information

For additional information and the full report, consult the Adaptech Research Network web site or contact one of the principal investigators.

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Sommaire - Etudiants ayant des handicaps au Collège Dawson : réussite et avenir

Rapport final présenté à PAREA
Printemps 2003

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Réseau de Recherche Adaptech – Collège Dawson, Montréal

Sommaire

Résumé

Dans le cadre d'une étude d'archives, les résultats scolaires de 653 étudiants ayant des incapacités du Collège Dawson furent comparés à ceux de 41 357 étudiants sans incapacités au cours d'une période de douze ans, soit de 1990 à 2002. Les résultats indiquent que les étudiants ayant des incapacités physiques et des troubles d'apprentissage avaient sensiblement le même taux de diplomation que ceux sans incapacités. Cependant, les étudiants ayant des incapacités prenaient approximativement un semestre de plus pour obtenir leur diplôme. Lorsque furent comparés les moyennes des notes et les taux de réussite de cours, les étudiants ayant des incapacités réussissaient aussi bien que, et dans certains cas mieux que, les étudiants sans incapacités. La tendance générale en ce qui a trait aux notes et aux taux de réussite de cours indique que les étudiants ayant des troubles d'apprentissage/de déficit d'attention avaient des taux de réussite semblables ou légèrement inférieurs à l'échantillon sans incapacités. Des résultats légèrement supérieurs ont été notés pour les étudiants ayant tous autres genres d'incapacités. Les garçons obtenaient des résultats inférieurs aux filles et ce, en ce qui a trait à tous les indicateurs, aussi bien pour les étudiants ayant des incapacités que ceux sans incapacités.

Préambule

Les résultats scolaires de 653 étudiants ayant fait une demande pour l'obtention de services pour étudiants handicapés au Collège Dawson (étudiants ayant des incapacités) ont été comparés à ceux de 41 357 étudiants n'ayant pas fait de demande de services (étudiants sans incapacités).

Le Collège Dawson est un collège préuniversitaire/communautaire (cégep public) situé au centre-ville de Montréal. Y sont offerts des diplômes (DEC : diplôme d'études collégiales) dans le cadre de programmes préuniversitaires de deux ans (secteur préuniversitaire – programmes d'études tels les Sciences de la nature et les Sciences humaines) et des programmes techniques de trois ans (programmes d'études tels les Soins infirmiers et Technique de génie mécanique). Des sessions d'accueil et des cours de formation continue sont également offerts.

Pour faire partie de l'étude, les étudiants (1) devaient s'être inscrits au Collège Dawson pour la première fois entre la session d'automne 1990 et la session d'hiver 2002 et (2) ne devaient pas avoir étudié au collégial auparavant. Des 722 incapacités notées pour les 653 étudiants (certains étudiants avaient plus d'une incapacité), 52,6% (380) étaient des troubles d'apprentissage et(ou) de déficit d'attention et 47,4% (342) étaient d'autres genres d'incapacités telles des déficiences visuelles, auditives, de la parole, orthopédiques, psychiatriques et médicales.

Quatre facteurs furent étudiés : les taux de diplomation, la moyenne des notes du premier semestre, les taux de réussite de cours (le pourcentage de cours suivis réussis) et les taux de réussite (pourcentage d'étudiants qui réussissent 100% des cours suivis au premier semestre).

Caractéristiques de l'échantillon

La comparaison des étudiants ayant des incapacités à ceux sans incapacités révèle qu'un pourcentage plus élevé d'étudiants ayant des incapacités étaient inscrits à des programmes préuniversitaires (72,7% contre 60,8%) et un pourcentage moindre était inscrit à l'éducation continue (8,3% contre 22,1%). La proportion inscrite à des programmes techniques était la même pour les deux groupes (11,3%). Les autres étudiants des deux groupes étaient inscrits aux sessions d'accueil. La différence existant dans les proportions d'étudiants inscrits aux divers secteurs était statistiquement significative. La majorité des étudiants des deux groupes était inscrite au programme préuniversitaire de Sciences humaines.

Les étudiants ayant des incapacités étaient, en moyenne, un an plus jeune (19,4 contre 20,5) et une proportion plus importante avait 19 ans ou moins (77,3% contre 72,2%) lorsqu'ils se sont inscrits pour la première fois au Collège Dawson. La différence d'âge s'explique principalement par la proportion importante d'étudiants plus âgés sans incapacités inscrits à des cours à l'éducation continue. L'âge moyen des étudiants ayant des incapacités et sans incapacités inscrits à des programmes techniques était de 19,3 ans. L'âge moyen des étudiants ayant des incapacités inscrits à des programmes préuniversitaires était de 18,7 ans tandis qu'il était de 18,3 ans pour les étudiants sans incapacités.

D'autres différences comprennent : (1) une plus grande proportion de l'échantillon ayant des incapacités était des garçons, avait l'anglais comme langue maternelle et était née au Canada ou aux États-Unis; (2) les étudiants ayant des incapacités avait généralement une moyenne de Secondaire V plus faible lorsqu'ils ont entrepris des études au Collège Dawson. Ces différences étaient statistiquement significatives.

Taux de diplomation

Les taux de diplomation ont été calculés pour les étudiants inscrits à temps complet à des programmes d'études menant à des diplômes. L'échantillon s'est arrêté en mai, soit à la fin de la session d'hiver 2002. Ceci a permis d'accorder à tous les étudiants au moins deux années supplémentaires au-delà de la période minimale requise pour l'obtention d'un diplôme. Par conséquent, seulement les étudiants qui ont commencé un programme d'études préuniversitaires entre 1990 et 1998 ou un programme technique de trois ans entre 1990 et 1997 sont inclus dans les analyses de taux de diplomation. Ces paramètres ont permis de cerner un échantillon de 316 étudiants ayant divers handicaps physiques, sensoriels ou troubles d'apprentissage et de 18 747 étudiants sans incapacités.

Programmes préuniversitaires de deux ans. Des 269 étudiants ayant tous genres d'incapacités qui ont entrepris des études dans le cadre de programmes préuniversitaires de deux ans entre 1990 et 1998, 55,0% ont obtenu leur diplôme (ou étaient admissibles à l'obtention d'un diplôme) à la fin de mai 2002. Au cours de la même période, 54,5% des 16 053 étudiants sans incapacités ont obtenu leur diplôme ou y étaient admissibles. La différence n'était pas significative. Lorsque l'échantillon préuniversitaire a été divisée entre ceux ayant des incapacités comprenant les incapacités multiples, mais excluant les troubles d'apprentissage (N=123),et ceux ayant des troubles d'apprentissage et(ou) de déficit d'attention (N=146), les taux de diplomation étaient de 54,5% et 55,5% respectivement. Encore une fois, la différence n'était pas significative.

Programmes techniques de trois ans. De même, des 47 étudiants ayant des incapacités qui ont entrepris des programmes techniques de trois ans entre 1990 et 1997, 53,2% avaient obtenu leur diplôme ou y étaient admissibles à la fin de mai 2002. Le taux était de 51,7% pour les 2694 étudiants sans incapacités pour la même période. La différence n'était pas significative.

Durée pour l'obtention d'un diplôme. Tel que l'on pouvait s'y attendre, les étudiants ayant des incapacités prennent un peu plus de temps que ceux sans incapacités pour l'obtention d'un diplôme. Pour les neuf cohortes préuniversitaires qui ont entrepris des études entre 1990 et 1998, les étudiants ayant des incapacités ont pris, en moyenne, 6,0 semestres pour obtenir un diplôme. Les étudiants sans incapacités ont pris, en moyenne, 5,2 semestres. Pour les huit cohortes de programmes techniques qui ont entrepris des études entre 1990 et 1997, il a fallu 8,2 semestres pour les étudiants ayant des incapacités et 6,9 semestres pour les étudiants sans incapacités pour l'obtention d'un diplôme. Ces différences, qui peuvent s'expliquer par le fait que les étudiants ayant des incapacités prennent généralement moins de cours, étaient statistiquement significatives. Conséquemment, il y avait une différence approximative d'un semestre pour les programmes préuniversitaires de deux ans et les programmes techniques de trois ans.

Moyenne des notes du premier semestre

Deux analyses distinctes ont été réalisées. La moyenne des notes du premier semestre a été calculée pour tous les étudiants y compris les étudiants de l'éducation continue, pour la période totale de 1990 à 2002. Y étaient inclus les notes des étudiants qui ont commencé à la session d'hiver. Afin de permettre la comparaison d'étudiants inscrits à un même programme, nous avons également analysé les notes des sous-groupes d'étudiants inscrits en Sciences humaines. En effet, la majorité des étudiants des deux échantillons y sont inscrits. Les divergences existant dans les champs d'études ne devraient pas agir sur les résultats car les cours requis pour ces étudiants sont les mêmes.

Tous les étudiants. Lorsque la moyenne des notes du premier semestre des 632 étudiants ayant des incapacités fut comparée à celle du groupe de 40 262 étudiants sans incapacités, aucune différence statistiquement significative entre les groupes fut relevée (66,3% contre 65,9% respectivement).

La moyenne des notes du premier semestre des garçons avait tendance à être plus faible que celle des filles et ce, pour les deux groupes d'étudiants. De plus, il n'y avait aucune différence significative (63,3% contre 63,2% respectivement) lorsque les garçons ayant des incapacités et sans incapacités furent comparés dans tous les programmes d'études. La comparaison des filles ayant des incapacités et sans incapacités n'a révélé aucune différence significative (69,4% contre 68,3% respectivement). Néanmoins, lorsque la moyenne de Secondaire V fut prise en considération, les garçons et les filles ayant des incapacités ont obtenu des résultats considérablement meilleurs que prévu comparativement aux garçons et aux filles sans incapacités.

La comparaison de la moyenne des notes de premier semestre de 347 étudiants ayant des troubles d'apprentissage/de déficit d'attention à celle de 285 étudiants ayant autres genres d'incapacités révèle que la moyenne était considérablement plus faible pour ceux ayant des troubles d'apprentissage/de déficit d'attention (63,7% contre 69,5%). Lorsque les notes des étudiants ayant des troubles d'apprentissage/de déficit d'attention furent comparées à celles des étudiants sans incapacités (63,7% contre 65,9%), la différence n'était pas significative.

Notes en Sciences humaines. L'analyse des notes du programme de Sciences humaines révèle que les étudiants ayant des incapacités (N=269) avaient des moyennes de notes considérablement plus élevées que les étudiants sans incapacités (N=13908) et ce, même lorsque la moyenne de Secondaire V n'était pas prise en considération en tant que covariante (66,0% contre 62,3%).

Les filles ayant des incapacités en Sciences humaines avaient des moyennes considérablement plus élevées que celles d'étudiantes sans incapacités et ce, qu'un ajustement soit apporté ou non pour leur moyenne de Secondaire V (70,9% contre 65,6%). Les garçons ayant des incapacités avaient également des moyennes de notes considérablement plus élevées comparativement aux étudiants sans incapacités (62,7% contre 58,7%) et obtenaient de meilleurs résultats que pouvait le laisser croire leur moyenne de Secondaire V à l'entrée.

Lorsque les notes des étudiants ayant des troubles d'apprentissage/de déficit d'attention furent comparées à la moyenne de notes des étudiants sans incapacités en Sciences humaines (63,6% contre 62,3%), la différence n'était pas significative.

Taux de réussite de cours

Tous les étudiants. Des 3385 notes pour les étudiants ayant des incapacités, 81,2%
étaient de notes de passage comparativement à un taux de 80,5% pour le groupe sans incapacités. La différence n'était pas significative. Cependant, le taux de réussite des étudiants ayant des troubles d'apprentissage (78,3%) était considérablement moins élevé que celui des étudiants sans incapacités (80,5%) et que celui des étudiants ayant autres genres d'incapacités (85,1%).

Sciences humaines. La différence du taux de réussite de cours dans le programme de Sciences humaines, cependant, révèle que les étudiants ayant des incapacités avaient généralement un taux de réussite plus élevé que les étudiants sans incapacités (80,5% contre 76,6%). Le taux de réussite pour les étudiants ayant des troubles d'apprentissage/de déficit d'attention (77,4%) n'était pas significativement différent que celui des étudiants sans incapacités même s'il était nettement plus faible que le taux de réussite des étudiants ayant autres genres d'incapacités (86,0%).

Réussite de cours

La proportion d'étudiants inscrits à temps complet dans des programmes menant à un diplôme (DEC) qui ont réussi 100% de leurs cours de premier semestre fut évaluée pour tous les programmes et pour les Sciences humaines.

Tous les programmes. Aucune différence significative n'a été relevée entre les étudiants ayant des incapacités et ceux sans incapacités (49,2% contre 49,4% respectivement). La comparaison des résultats des étudiants ayant des troubles d'apprentissage/de déficit d'attention et du groupe ayant autres genres d'incapacités ainsi que ceux du groupe sans incapacités révèle une différence significative (43,4% contre 57,1%), les étudiants ayant des troubles d'apprentissage ayant le taux de réussite le moins élevé.

Sciences humaines. Le taux de réussite des étudiants ayant des incapacités était considérablement plus élevé que celui des étudiants sans incapacités (48,1% contre 41,4%). Celui des étudiants ayant des troubles d'apprentissage/de déficit d'attention (41,6%) n'était pas significativement différent que celui des étudiants sans incapacités (41,4%), même s'il était nettement plus faible que le taux des étudiants ayant autres genres d'incapacités (58,8%).

Sommaire

Les résultats révèlent que les étudiants ayant des incapacités au Collège Dawson avaient un taux de diplomation sensiblement identique à celui des étudiants sans incapacités. La différence principale était que les étudiants ayant des incapacités prenaient, en moyenne, approximativement un semestre de plus pour obtenir leur diplôme. Lorsque la moyenne des notes fut analysée, les étudiants ayant des incapacités réussissaient aussi bien, et dans certains cas considérablement mieux, que les étudiants sans incapacités. Lorsque les étudiants ayant des incapacités furent divisés en deux groupes, étudiants ayant des troubles d'apprentissage/de déficit d'attention et étudiants ayant autres genres d'incapacités, la tendance générale indiquait que les étudiants ayant des troubles d'apprentissage/de déficit d'attention obtenaient des résultats semblables ou moindres que le groupe sans incapacités et que les étudiants ayant autres genres d'incapacités obtenaient des résultats légèrement supérieurs. Les garçons obtenaient des résultats moindres que les filles, et ce pour tous les indicateurs. Ceci a été confirmé pour les étudiants ayant des incapacités aussi bien que pour ceux sans incapacités.

Conséquences

Qu'est-ce que ces résultats signifient pour le réseau collégial et pour la société québécoise? Les étudiants ayant des incapacités devraient-ils être encouragés à poursuivre des études post-secondaires? Les fonds avancés pour les appuyer au collégial sont-ils bien dépensés? Bien sûr!

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Introduction

The public cegeps provided postsecondary education to approximately 145,000 Québec citizens in 2001 (Ministère de l'éducation du Québec, 2003). Postsecondary education has been targeted as a key vehicle for providing a labour force ready to meet the challenges of the new workplace (Butlin, 1999). Indeed, the 2001 Canadian Census showed that of the increase in the labor force between 1991 and 2001, almost half of the growth "occurred in highly skilled occupations that normally require university qualifications" (Statistics Canada, 2003). In its recently released report, *Knowledge Matters*, the Government of Canada (2002) estimates that, "by 2004, more than 70 percent of all new jobs created in Canada will require some form of post-secondary education." Similar sentiments have recently been voiced for the Québec context (e.g., Cartier, 2000).

As we become increasingly reliant on the new knowledge based economy, individuals with disabilities can have an unprecedented opportunity to fully participate in the social and economic life of their communities. The 10% of Quebeckers over the age of 15 who have some level of disabilities (Statistics Canada, 2002a) will have promising new possibilities in an environment where valuable commodities are no longer physical goods and services but information and knowledge (e.g., Loewen & Tomassetti, 2002; Wolfe & Gertler, 2001). However, this will only become a reality when they have the same opportunities for postsecondary education as other Quebeckers.

It is only in the past two decades that North American institutions of higher education have begun to recognize the need to deliver disability related services to people with disabilities (Fichten, Bourdon, Creti, & Martos, 1987; Hill, 1992). This is also true of Québec's cegeps (Leblanc, 1990, 1999). During this time, the number of people with disabilities in postsecondary education has increased substantially, both in the US and in Canada (e.g., Hill, 1996; Louis Harris & Associates, 1994; Tousignant, 1995). The increase has also been felt in the cegeps (e.g., Clermont, 1995; Freedman & Havel, 1994). Nevertheless, there are signs that, at least in Québec, the numbers of students with disabilities in postsecondary education have leveled off since the mid 1990s (e.g., OPHQ, 1998; AQEHPS, 1999; Généreux, 2001; Senécal, 1998).

According to Louis Harris & Associates (cited by the National Organization on Disability, 1999), by 1998 more than half of adults with disabilities in the United States (51%) had completed some college - a proportion almost identical to that for the non-disabled population. In Canada, a substantially smaller proportion of individuals with disabilities (35%) than without disabilities (49%) had some postsecondary education (Statistics Canada, 1992). Recent data indicate that by 1996, 26% of individuals with and 32% of individuals without disabilities completed either college or trade school training (Human Resources Development Canada, 2002). Twelve percent of Americans with disabilities graduated from university compared to 23% of the non-disabled population (Harris Interactive, 2000). Projections based on the 1991 Health and Activity Limitations data (cf., Fawcett, 1996; Statistics Canada, 1992) and evaluations made by the Office des Personnes Handicapées du Québec (e.g., Allie & Hébert, 1998; OPHQ, 1995) suggest that this figure is likely to be lower in Canada. Indeed, according to the recently released "*Advancing the Inclusion of Persons with Disabilities – A Government of Canada Report*" (Human Resources Development Canada, 2002), in 1996 only 7% of Canadians with disabilities held a university degree. The comparable figure for non-disabled Canadians was 17%, more than double the rate for Canadians with disabilities.

Postsecondary education is as important for individuals with disabilities as it is for the rest of the Québec population because it helps fulfill personal goals, allows for effective competition in the job market and contributes to independence and financial security. Postsecondary graduates with and without disabilities have better employment outcomes than their counterparts with no postsecondary education (e.g., Allen, Harris, & Butlin, 2003; Horn & Berktold, 1999; Government of Canada, 1996; Nichols, 1998; Stodden & Dowrick, 2000). Data on postsecondary students and graduates with disabilities indicate that most want to work (Hubka & Killean, 1996). It has been shown, for example, that although employment of university graduates with disabilities is somewhat lower than that of their non-disabled peers both in the U.S. (e.g., Horn & Berktold, 1999) and Canada (Fawcett, 1996), once employed, salaries are similar, and rates of employment are still substantially higher than rates for students who did not complete university. Students who attend college, in turn, fare better than those who never went to college (Canadian Council on Social Development, 2002; Government of Canada, 1996; Nichols, 1998; Louis Harris & Associates, 1994). In general, students with disabilities are more likely to enroll in colleges than universities in Canada, England and the United States (e.g., Fichten, Asuncion, Barile, Robillard, Fossey, & Lamb, 2003; Horn & Berktold, 1999; Richardson, 2001; Richardson & Roy, 2002).

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1.1 The Québec Context

Postsecondary education is highly valued in Québec. For example, data from the latest census (cited in Stahlman, 2000) shows that Montréal had a larger proportion of higher education students than any of the 29 largest Canadian and American cities. Québec ranks close to the top of the western world when it comes to schooling (Direction des statistiques et des études quantitatives, 1999; Lefebvre, 2000). Among new educational objectives announced recently by the Conseil supérieur de l'éducation (2000) is the goal of 40% of the Québec population under age 30 attending a university within the next decade (compared to the current 20% of the population over age 15), with 30% graduating. For youth with disabilities, equal targets should be adopted and pursued. Yet, our findings show that of all Canadian provinces, Québec has the lowest proportion of postsecondary students with disabilities (Fichten, Asuncion, Robillard, Fossey, Généreux, Guimont, & Lamb, 2001; Fichten, Barile, & Asuncion, 1999; Fichten, Asuncion, Barile, Robillard, Fossey, Judd, Guimont, Tam, Lamb, Généreux, Juhel, Senécal, & Wolforth, 2001; Fichten, Asuncion, Barile, Robillard, Fossey, & Lamb, 2003).

Postsecondary students with disabilities on Québec campuses. In the late 1970s and 1980s a number of investigations were undertaken with respect to Québec students with disabilities (e.g., Bérubé, Deschênes, & Juhel, 1985; Coallier, et al., 1987; Direction générale de l'enseignement collégial, 1989; Fédération des cégeps, 1988; Lavoie, 1986; Picard, 1986; Ministère de l'Enseignement supérieur et de la science, 1990; Benoit & Gauthier, 1985; Young & Zawilski, 1980). Most studied and made recommendations about what needed to be done to allow students with disabilities to attend postsecondary education. With the exception of our own studies (e.g., Amsel & Fichten 1990; Fichten, et al., 1990, 1995, 1996) and some other notable exceptions (e.g., AQEHPS, 1999; HERMES-Information stratégique, 1999; Leblanc, 1999; Ministère de l'éducation, 1995; Tousignant, 1995; Tremblay & Charron, 1992; Tremblay, Lacroix, Lacerte, Charron, & Noelting, 1994), research in the 1990's has been sparse. In addition, in spite of the prevailing North American trend for students with learning disabilities to make up between ¼ and ½ of students with disabilities (e.g., Horn & Berktold, 1999; Jackson et al., 2001; Roessler & Kirk, 1998; Scott, 1997; Statistics Canada, 2002b), much of the cegep based literature with respect to disabilities excludes students with learning disabilities such as dyslexia.

Encouraging students with disabilities to attend cegep is an important concern because the number of individuals with disabilities attending postsecondary education in Québec is very low. Data on the number of students with disabilities on campus are affected by the definition of disability used, what question is asked, of whom it is asked, and how percentages are calculated. In large scale American freshman studies, most research is based on self-reports (e.g., Henderson, 1995; 1999; 2001) and Canadian postsecondary graduate surveys (e.g., Paju, 1997; Taillon & Paju, 1999). Nevertheless, a substantial number of studies use responses of on-campus professionals who provide disability related services. Students identify themselves to these professionals as needing services or accommodations. Between 1/4 to 1/2 of students with disabilities who are enrolled in postsecondary education register to receive disability related services (Fichten, Asuncion, Barile, Robillard, Fossey, & Lamb, 2003).

At most North American colleges and universities, including the cegeps, there is at least one designated person whose responsibility it is to provide disability related services and accommodations to students with documented disabilities. Operating on campus from a specialized office (e.g., Center for Students with Disabilities) or a mainstream one (e.g., Student Services), these individuals offer a range of services such as exam accommodations, advocacy, peer tutoring, production of academic material in alternative formats such as on tape, in Braille, etc. and assistance with specialized computer technologies (e.g., Juhel, 2000). Students with disabilities have the option of registering to receive such services. In most cases, the student needs to provide documented proof of the disability and the need for specialized services. Many students with disabilities fail to register because they: do not need services, do not wish to be "stigmatized" as a student who has a disability, have a desire to "make it like anyone else," etc. (Fichten, Bourdon, Creti, & Martos, 1987). In several studies, including our own, the number of students with disabilities is determined by asking campus based disability service providers to indicate how many students are registered to receive disability related services.

In the case of cegeps there is a another source of information based on data provided by the cegeps that have been designated as "centres d'accueil:" the Service d'Aide à l'Intégration Des Élèves (SAIDE) at Cégep du Vieux Montréal, Le Services aux étudiants handicapés du Cégep de Sainte-Foy, and Dawson College (Ministère de l'éducation du Québec, 1998). This represents those students for whom an individualized education plan (IEP/IIP) had been submitted and approved, and for whom services provided by the cegeps are funded by the Ministère de l'éducation du Québec (MEQ). The number of students who have been recognized to receive services by the MEQ is considerably lower than the numbers furnished by disability service providers for virtually all public cegeps (Fichten, Barile, Robillard, Fossey, Asuncion, Généreux, Judd, & Guimont, 2000).

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Results of recent large scale Canada-wide and Québec based studies of students registered to receive campus based disability related services indicate that, overall, 2½% of Canadian students are registered to receive disability related services form their postsecondary institutions; this varies from ½% to 6% in different provinces (Fichten, Asuncion, Barile, Robillard, Fossey, & Lamb, 2003). Junior/community colleges had a higher percentage of students with disabilities registered to receive disability related services (3¾ %) than universities (1 %). Québec has a substantially smaller proportion of both college (0.6% vs 6%) and university (0.4% vs 2½%) students with disabilities than the rest of Canada. Although lack of recognition of learning disabilities for postsecondary funding by the Québec government is an important contributor to the small percentages (cf. Cardyn, & Bégin, 1998; Tousignant, 1995), it cannot explain the huge discrepancies between Québec and the rest of Canada. Consistent with our findings, others, too, have commented on the low enrollment of students with disabilities in Québec postsecondary institutions (Allie & Hébert, 1998; AQEHPS, 1999; Maisonneuve & DeCorwin, 1994; OPHQ, 1995, 1998). Maisonneuve and DeCorwin (1994) blame inadequate opportunities for education and training for the low employment rate of people with disabilities in Québec. Although the figures above represent only the ¼ to ½ of students with disabilities on campus who register to receive disability related services, the low number of students, as well as of workers with disabilities in Québec (Association des paraplégiques du Québec, 1994), makes it especially important to know about what happens to the students who are enrolled.

1.2 Factors Related to Academic Success

The literature on non-disabled students, driven by several theoretical views (e.g., Pascarella & Terenzini, 1994), shows that a variety of factors are related to academic success when this is defined in terms of grades and graduation (e.g., Astin, 1993; Flippo & Cavalry, 2000; Pinto, 1993). These can be categorized into "individual" (e.g., age, sex, high school grades) and "college program related" variables (e.g., pre-university program, careers program). Research on predictors of student success has gone on in Québec (Barbeau, 1994; Cokley, 2000; D'Amours, 1992; Meunier, 1989; Ouellet, Delisle, Couture, & Gauthier, 2000) as well as elsewhere, and is of considerable interest to the MEQ (1998). All cegeps in Québec have been required by the MEQ to develop student success action plans (e.g., Dawson College, 2000a; Comité sur la réussite du Cégep de Sainte-Foy, 2000) and many, including Dawson, have already carried out research on this topic (e.g., Denison, 2000, Dawson College, 2000b).

Substantial data relevant cegep students in general exists. But what about students with disabilities? Are the conventional predictors of student success (defined as graduation within a reasonable period and grades) (cf. Dawson College, 2000a), relevant to this population of students? Or are there unique contributors for them? The literature here is particularly weak. For example, Québec-based data show that when university students with disabilities graduate, they frequently obtain high grades (Wolforth, 2000) and that cegep students who are Deaf are slightly more likely than other students with disabilities to obtain their DEC (Étudiants handicapés du Cégep de Sainte-Foy, undated). Similarly, a study by the SAIDE of Cégep du Vieux Montréal on western Québec cegep students with hearing impairments showed that between 1982 and 1994 the number of students with hearing impairments increased, and that 53% of students graduated, 32% did not complete their studies and 15% were still students at the time of the study (Clermont, 1995). In general, there is surprisingly little systematic research on this topic and there are no ongoing projects to study success outcomes of students with disabilities in the cegeps. Studies which do exist are based primarily on the limited number of students for whom an individualized education plan had been submitted and approved, and for whom services provided by the cegeps are funded by the MEQ. As noted earlier, the number of such students is substantially lower than the number registered with their colleges to receive disability related services (Fichten, Asuncion, Barile, Robillard, Fossey, & Lamb, 2003) and, thus, they do not adequately represent either the actual number of students with disabilities registered to receive services at the cegeps or their academic performance related characteristics.

1.3 Goals and Hypotheses for the Present Investigation

In Québec, despite twenty years of planning, special funding, and the provision of specialized disability related services in the cegeps (cf. Leblanc, 1999) very little is known about how students with disabilities fare once they enter college. What proportion of them graduate or drop out? What programs do they attend? How long does it take students to graduate? What kinds of grades do they receive? What are the predictors of successful outcomes for students with disabilities? How do these compare to those for non-disabled students? The goal of this study was to provide answers to these questions for the largest cegep in Québec, Dawson College.

Dawson is located in the downtown area of Montreal, a city with a population of 1.8 million. Since 1999, full-time day enrolments have ranged between 7000-7500. In addition 1800-2000 students enroll as part-time students through the continuing education division.

Dawson College's (undated) Mission Statement outlines its commitment to prepare students for university or immediate employment. The College offers 19 career programs (of 3 years duration) and 5 pre-university programs (of 2 years duration) leading to a DEC (Diplôme d'études collégiales). About 30% of its full-time day students are enrolled in the career and 70% in the pre-university sector.

To ascertain what happened to students with disabilities after they enrolled at Dawson College we conducted an archival comparative study of the "success" outcomes of students with and without disabilities who first enrolled at Dawson College between 1990 and 2002. Four success indicators were chosen for analysis: (1) graduation rates (over three time frames); (2) average grades in the first semester; (3) course pass rates; (4) course success (percent of students who passed 100% of the courses they undertook in the first semester).

The following hypotheses were tested.

1. Disability status will be an important variable when time taken to graduate is evaluated. Other success criteria, such as grades, will not be affected by having a disability.
2. Students with learning disabilities may perform at a different level than students with other disabilities. We have no basis for formulating a hypothesis concerning the direction of the difference.
3. Individual factors that predict success for non-disabled students will be important predictors of success for students with disabilities as well.
4. Females will have better success outcomes than males, regardless of disability status.
5. Students with disabilities will be over-represented in: (a) social sciences and (b) and continuing education.

Methodology

2.1 Students Included In The Study

The sample consisted of 653 students (338 males; 315 females) who were registered to receive disability related services from Dawson College's Center for Students With Disabilities (students with disabilities) and 41,357 students (19,770 males; 21,587 females) who did not make a request for services (non-disabled students). To be included in the study, students (1) must have enrolled at Dawson College for the first time between the autumn session of 1990 and the winter session of 2002, (2) must have had no prior history of having studied at a cegep, and (3) if the student had a disability, they had to have had this for a minimum of 6 months (cf. Taillon & Paju, 1999). Eligible students were identified based on the computerized records of Dawson College. Students with disabilities comprised 1.6% of the total sample. Although the number of students with disabilities enrolled at Dawson College during the study period is likely to have been higher, this figure is realistic when compared to other data reporting the proportion of students registered to receive disability related services in all cegeps (Fichten, Asuncion, Barile, Robillard, Fossey, & Lamb, 2003).

2.2 Procedure For Classifying Students

Students with disabilities. Of the 722 disabilities recorded for the 653 students (some students had more than one disability), 52.6% (380) were learning disabilities and/or attention deficit disorder (ADD) and 47.4% (342) were other disabilities such as visual, hearing, speech, orthopedic, psychiatric and medical impairments.

Students who attend Dawson College are able to register for disability related services through the College's Center for Students With Disabilities. The Center is designed to address the needs of students with disabilities registered in diploma programs as well as in continuing education courses. Upon admission to Dawson College, students with disabilities are encouraged to identify themselves to the Center for Students with Disabilities by providing the necessary documentation to support their request for services. Although only students with major functional disabilities (visual, hearing, motor or organic impairments) are recognized by the Ministère de l'éducation (MEQ) for funding, other students, including those with learning disabilities, attention deficit disorder, psychiatric illness, and minor physical disabilities, are eligible for a variety of services offered through the Center. These include: early registration in appropriate courses of their choice, automatic permission to take a reduced course load, access to adaptive technologies (e.g., specialized software such as screen enlargement, text-to-speech, scanning), and special exam accommodations (e.g., extended time, distraction-free environment, scribes). Note-takers and material in alternative format (e.g., Braille, enlargement, audiotape) are made available upon request, as are oral and sign language interpreters, attendant care workers and lab assistants. Liaison with the College's Learning Centre provides assistance to students with disabilities such as ready access to peer tutors, writing tutors, and educational consultants. Liaison with faculty who are, in fact, the key figures in accommodating students with disabilities in the college milieu, assures that professors understand and are open to accommodating the varying needs of students with disabilities in their classes.

An analysis of the number of students with disabilities who, according to Dawson's computerized database, have been identified as having a major functional disability indicates that since the autumn of 1993 there have been only 109 students so identified. In the fall of 2000, approximately 180 Dawson students were registered with the Center as eligible to receive disability related services, although only 49 of them were "officially" designated as having a disability (i.e., have had an individualized education plan (IEP/IIP) submitted to the Ministère de l'éducation (MEQ)). This indicates that most students who were eligible to receive disability related services from Dawson were not officially recognized by the MEQ as having a disability. Therefore, extensive evaluation and categorization of the archives of Dawson's Center for Students with Disabilities was undertaken to obtain the sample.

Students' records at the Center usually indicate their "primary" or "most important" impairment which necessitates an accommodation. Although some of the students may have had several impairments, for the purpose of setting accommodations few were identified as having more than one. Students were classified by the Coordinator of the Center as having one or more of the following:

- Visual impairment
  - Low vision
  - Blind
- Mobility impairment
  - No wheelchair
  - Wheelchair
- Arm/Hand coordination problem
- Communication impairment
- Hearing impairment /Deafness
  - Oral
  - Sign
- Learning disability and/or attention deficit disorder (ADD)
- Psychiatric impairment
- Chronic medical condition
- Other impairment or disability

The Center's records were incomplete in a variety of cases. Therefore, we contacted students whose eligibility was uncertain by telephone (see Appendix 3 for the telephone script). Students were asked to self identify as having one or more impairments in accordance with the criteria noted above. Students with temporary disabilities (i.e., less than 6 months duration – see Taillon & Paju, 1999) were excluded from the analyses.

The majority of students in the sample had used the Center's services for pre-registration at least once between 1990-2002. This is a popular service for most students because it allows them to select their courses and course times before other students, when places are still available. These students also receive some guidance regarding course selection and course load.

Non-disabled students. Non-disabled students were those 41,357 students who met the eligibility criteria but did not register with the Center for Students with Disabilities. However, it is highly likely that some of the students included in this group had a disability.

A satisfaction survey conducted at the College in 2002 (Office of Institutional Research, 2002) resulted in 1575 responses. Of these, 9% self-identified as having a disability. Although this figure related to the total student population rather than first-time full-time college commencers, it represents a substantially larger number of students than the 1.6% of the total sample who are considered to be students with disabilities in this investigation. Moreover, the 9% figure is consistent with the findings of large scale American surveys which show that approximately 9% of university and college freshmen self-reported as having a disability (Henderson 1995,1999) and that 6% to 8% of first time full-time commencers at universities reported at least one disability (Henderson 2001). However, given the relatively large size of the sample (41,357), the inclusion of students with disabilities who did not register with the Center is likely to have only a very minor impact.

2.3 Student Characteristics

Characteristics of students with and without disabilities, classified according the procedures described in Section 2.2, were compared with respect to demographics, academic background, academic programs in which students were registered and the first semester course load in order to explore any differences which could impact on the academic outcomes of students.

2.4 Success Indicators

Four measures commonly used to compare the academic outcomes of students were examined:

- **Graduation rates in diploma programs** (in prescribed time; prescribed time plus two years; over the entire period of observation)
- **Average grades in the first semester of study**
- **Course pass rates in courses undertaken in the first semester of study**
- **Course success rates** (percentage of students who passed 100% of the courses they undertook in the first semester)

Graduation rates. A cohort based tracking system was used to determine graduation rates for full-time students enrolled in diploma programs. The progress of each cohort of students who commenced their studies as full-time students in the autumn session of each year from 1990 to 1998 was tracked, and their status in May, at the end of the Winter session of 2002, was determined. Finalizing the data gathering at the end of the 2002 winter session allowed all students in the sample at least two additional years beyond the minimum time required to complete their diplomas. Therefore, only students who commenced in two-year pre-university programs between 1990 and 1998 or in three-year career programs between 1990 and 1997 were included in analyses of graduation rates. This resulted in a sample of 316 students with various physical, sensory and learning disabilities/ADD and 18,747 students with no disabilities. The number of students commencing full-time in each autumn (A) cohort between A1990 and A2001 is shown in Table 1.

Table 1

Number of students in each commencing cohort (Autumn 1999 – Autumn 2001) used to calculate graduation rates.

Cohort	Pre-University Programs		Career Programs	
	Disability	No Disability	Disability	No disability
A1990	30	1,878	4	297
A1991	24	1,967	2	322
A1992	29	2,156	4	334
A1993	32	1,486	11	304
A1994	26	1,513	5	305
A1995	32	1,699	8	349
A1996	21	1,768	5	346
A1997	37	1,760	8	437
A1998	38	1,826	n/a	n/a
Total	**269**	**16,053**	**47**	**2,694**

These cohorts were used to calculate the graduation rates. There were too few students commencing in the Winter semester on which to base a meaningful analysis.

Source data were obtained from the student records system of Dawson College. Students were tracked based on their student identification numbers. If the student graduated, as indicated by their presence on the College's graduation file, then their history with a particular cohort was concluded, and the graduation rate of the cohort augmented. If students were no longer enrolled at the time of observation, and had not graduated, they were considered to have left their studies at Dawson. However, if students from a particular cohort left and then returned at a later date to continue their studies, their history with the cohort continued until a graduation was recorded.

At the end of the Winter 2002 session, each student in each commencing cohort was identified as follows:

- 'Graduated in the period of observation' = Grad_PO
- 'Graduated in prescribed time' = Grad_PrT
- 'Graduated in prescribed time plus two years' = Grad_PrT2
- 'Still enrolled' = R
- 'Left the College without completing their studies' = A

The graduation rate was calculated by dividing the number of students who graduated by the total number in the commencing cohort. These rates, used in the College's tracking of students, are cumulative (i.e., those flagged as graduating in the period of observation include those who graduated in PrT and PrT2, and those who graduated in PrT2 include those who graduated in PrT).

The total commencing cohort (T _Cohort) is determined as follows:

T_Cohort = GradPO + R + A

The graduation rates are calculated as follows:

- %Grad_PO = Number Grad_PO/T_ Cohort
- %Grad_PrT = Number Grad_Prt/T_Cohort
- %Grad_PrT2 = Number GradPrT2/T_Cohort

It is possible that students who left Dawson without completing their diplomas may have gone on to do so at another college. It is, in fact, known that approximately 2% to 3% of each commencing cohort at Dawson do complete their diploma at another cegep. Whether students with disabilities do so at a similar rate is unknown. The calculated rates are for graduations at Dawson, and will tend to under-report the true rates at which students graduate from college.

Due to the small numbers of students with disabilities comprising each cohort, the graduation rates were averaged for combined cohorts. The rates for pre-university cohorts commencing between A1990 and A1998 were averaged (n=269 for students with disabilities), since at the time that the data gathering was finalized, the A1998 cohort was the latest cohort for which graduation rates in prescribed time plus two years could be determined. For the same reason, graduation rates for career programs, a year longer in duration, were averaged for cohorts commencing between A1990 and A1997 (n=47 for students with disabilities).

For the purpose of this study the measures used to compare the graduation rates of the two groups of students are defined as follows:

- ***Graduation rate in prescribed time (Grad_PrT):*** The percent of students in the commencing cohort who graduate in the minimum time prescribed for the program. This will occur if all courses are attempted and passed as outlined in the program description. Prescribed time is two years (4 semesters) for the College's pre-university, and three years (6 semesters) for the College's career programs.
- ***Graduation in prescribed time plus two years (GradPrT2):*** The percent of students in a commencing cohort who graduate within the minimum time prescribed for the program plus two years. This is four years (8 semesters) for the College's pre-university and five years (10 semesters) for the College's career programs.
- ***Graduation over the period of observation (GradPO):*** The percent of students in a commencing cohort who graduate over the period of the investigation. In this study the longest period of observation is for the Autumn 1990 commencing cohort as at the end of the Winter semester of 2002 - a total of 12 years or 24 semesters. The shortest period of observation is for the 1998 cohort – a total of 8 semesters or 4 years. A table showing the period of observation for each successive commencing cohort is shown in Appendix 1.

Average grades in the first semester. The grades for each course undertaken for students in their first semester of study were obtained from the College's grades files. The grade averages of students with and without disabilities were compared.

Course pass rates in the first semester. The course pass rate is calculated by dividing the total number of passing grades by the total number of grades received by each of the two groups of students being compared.

Course success rates in the first semester. The percent of students who passed 100% of the courses they undertook in the first semester.

2.5 Method of Analysis

Characteristics of students with and without disabilities are compared with respect to demographics, academic background, academic programs in which students were registered and the first semester course load. This is followed by a comparison of the academic success of both groups based on the analysis of the selected indicators.

For the analysis of course load, graduation and course success rates, only full-time day students enrolled in diploma programs were included. For the grades analysis and course pass rates the grades for all students in all sectors were included, including those students in continuing education. Continuing education includes those students who are studying part-time in the evening. They may be undertaking studies in attestation programs (AEC's - usually of less than one year duration) or may be studying out-of-program. Data were also analyzed for the subgroup of students who were enrolled in the Social Science program. This was the program in which the largest proportion of both students with and without disabilities were registered. Because course requirements for these students are the same, differences due to discrepancies in field of study would have a minimal impact on the results.

Since the number of students in most of the disability classifications was small, it was difficult to compare the success indicators by disability type. Therefore, an analysis was carried out comparing the success indicators for students with learning disabilities/ADD (the largest group) to the remaining students who were grouped into an 'all other disabilities' classification. Differences were considered significant at $p<=.05$ for the statistical tests used.

3.1 Nature of Students' Disabilities

An examination of the nature of the disabilities recorded for the 653 students in the sample shows that the most common disabilities recorded by the Centre were learning disability/attention deficit disorder (52.6%), followed by chronic medical (14.1%) and psychiatric disorders (8.4%) (Table 2).

Table 2
Nature of the disabilities of the 653 students in the sample.

Nature of Disability	Number	%
Visual impairment		
Low Vision	26	3.6%
Blind	7	1.0%
Mobility impairment		
No wheelchair	22	3.0%
Wheelchair user	34	4.7%
Arms & hands	18	2.5%
Hearing impairment/Deafness		
Oral	35	4.8%
Sign	16	2.2%
Communication impairment	7	1.0%
Learning disability / ADD	380	52.6%
Psychiatric impairment	60	8.4%
Chronic medical condition	102	14.1%
Other disability or impairment	15	2.1%
Total	**722***	**100%**

* The total exceeds 653, because 54 students had more than one disability.

3.2 Demographic Characteristics

A comparison of the gender, language background, country of birth and age of students with and without disabilities upon entry to college at Dawson is shown in Table 3. From Table 3 it can be seen that students with disabilities, when compared to non-disabled students, included a significantly higher proportion of males, students whose mother tongue and language used was English, and students who were born in Canada or the USA.

Table 3

Student characteristics – comparing students with disabilities and non-disabled students.

Demographic Characteristic	Students with Disabilities		Students with No Disability		Test	
	Number	%	Number	%	ChiSq (df=1)	p
Female	315	48.2%	21,587	52.2%	4.04	.045
Male	338	51.8%	19,770	47.8%		
Mother tongue English	528	80.9%	22,167	53.6%	192.31	.000
Language used English	616	94.3%	35,596	86.1%	36.96	.000
Born in Canada/USA	576	88.2%	29,117	70.4%	98.33	.000
Aged 19 or under	505	77.3%	29,845	72.2%	8.57	.003
Total Sample	**653**	**1.6%**	**41,357**	**98.4%**		

In addition, a greater proportion of students with disabilities were aged 19 or under (77.3% vs 72.2%; ChiSq(1)=8.57; p=.003). The age distribution of students with and without disabilities can be found in Appendix 2. The average age of students by sector of enrolment is compared in Section 3.4.

3.3 Academic Background – Average High School (Secondary V) Scores

Many students are admitted to cegep on the basis of their average grades in the last year of high school. This is referred to as the Secondary V average (SecV). Not all students have a SecV record in the College's archives because some students were admitted on a basis other than their performance in high school. In addition, scores prior to 1992 were not available for analysis. Averages for those students in the sample for whom scores were available (76% of students with a disability and 59% of non-disabled students) were compared to determine whether students with disabilities entered with higher or lower scores than non-disabled students.

Table 4 shows sample sizes and average SecV scores at entry for males and females with and without disabilities. A 2X2 ANOVA comparing disability status (non-disabled vs students with disabilities) and gender (females vs males) showed that there was a significant main effect for gender. Females had higher SecV averages than males ($F(1;25,165)=38.10$; $p=.000$). In addition, there was a significant main effect for disability status. Students with disabilities had lower SecV averages compared to their non-disabled peers ($F(1;25,165)=17.92$; $p=.000$). There was no significant difference for the disability X gender interaction ($F(1;25,165)=1.11$; $p=.292$). Females with disabilities had lower scores than females without disabilities, and males with disabilities had lower scores than males without disabilities.

Table 4

Comparison of the SecV averages of males and females with and without disabilities.

Samples	Females		Males		Total	
	N	Mean SD	N	Mean SD	N	Mean SD
Students with disabilities	251	70.4±11.2	245	66.4±11.7	496	68.4±11.6
Non-disabled students	13,502	72.1±12.0	11,171	69.3±12.2	24,673	70.8±12.1
Total	13,753	72.1±11.9	11,416	69.3±12.2	25,169	70.8±12.1

Some of the SecV averages recorded were lower than 50, and suggested that students had been admitted on a basis other than their high school grades. When the SecV comparison was repeated using only averages at or above 50 (which would have qualified students for entry to cegep prior to 1997. From 1997 onwards the value was 60), the results were similar (Table 5).

Table 5

Comparison of the SecV averages of males and females with and without disabilities for SecV averages of at least 50.

Samples	Females		Males		Total	
	N	Mean SD	N	Mean SD	N	Mean SD
Students with disabilities	233	72.8±7.0	221	69.6±6.6	454	71.2±7.0
Non-disabled students	12,610	74.6±7.7	10,267	72.2±7.6	22,877	73.5±7.8
Total	12,843	74.5±7.7	10,488	72.1±7.6	23,331	73.4±7.8

There were statistically significant differences between the SecV averages of students with and without disabilities ($F(1;23,327)=35.15$; $p=.000$), as well as between those of males and females ($F(1;23,327)=59.35$; $p=.000$). There was no significant gender X disability interaction ($F(1;23,327)=1.20$; $p=.274$). The sample sizes, means and standard deviations are presented in Table 5.

3.4 Academic Program

Table 6 presents the percentage of students who commenced in the different sectors and their average age at commencement. When students with and without disabilities were compared, it was found that a higher proportion of students with disabilities were enrolled in pre-university programs (72.7% vs 60.8%) and a lower proportion in continuing education (8.3% vs 22.1%). The proportion enrolled in careers programs was the same for both groups (11.3%). The remaining students from both groups were enrolled in preparatory sessions. The difference in the proportions of students enrolled across the four sectors was statistically significant (ChiSq(3) = 75.76; p=.000). The number and proportion students who commenced by sector is shown in Table 6.

Table 6
Comparison of enrolment sector of student with and without disabilities.

Group	Variable	Pre-University	Careers	Preparatory	Continuing Education	Total
Students with disabilities	Average age (yr)	18.7±3.5	19.3±3.6	21.0±9.6	24.8±6.8	19.4±4.9
	% Commencing	72.7%	11.3%	7.7%	8.3%	100%
	Number of Students	475	74	50	54	653
Non-disabled students	Average age (yr)	18.3±2.8	19.3±4.7	18.6±3.9	27.6±9.8	20.5±6.6
	% Commencing	60.8%	11.3%	5.7%	22.1%	100%
	Number of students	25,157	4,689	2352	9,159	41357
Total	Average age (yr)	18.3±2.8	19.3±4.7	18.6±4.1	27.5±9.8	20.4±6.6
	% Commencing	61.0%	11.3%	5.7%	21.9%	100%
	Number of students	25,632	4,763	2,402	9,213	42,010

A two-way ANOVA (4 sectors (pre-university / careers / preparatory / continuing education) x 2 disability status (with a disability / no disability)) was conducted to compare the mean ages across sectors for students with and without a disability. There was a significant main effect for sector (F(3;42,002) = 131.58; p=.000). Tukey HSD post hoc test results showed that students in the pre-university sector were significantly younger than those in the careers sector, and that both of these groups were younger than students in the preparatory sessions. Students in continuing education were significantly older than those in all other groups.

The difference in mean ages between students with and without a disability across all sectors was not significant (F(1;42,002) =0.08; p=.935). However, the sector X disability status interaction was significant (F(3;42,002) = 8.31; p=.000). Post hoc tests show that the mean ages of the two groups within the pre-university sector were not significantly different. The same was true for the careers sector. However, the average age of students with disabilities was significantly higher than that of non-disabled students in the preparatory sector and lower in continuing education. The mean ages and standard deviations by sector are shown in Table 6.

Of the total students with disabilities (653), 42.1% were enrolled in the Social Science program as were 34.2% of the total non-disabled group. A detailed breakdown by program of enrolment is shown in Appendix 4.

3.5 Course Load

It is College policy that students register for a full course load. A full course load allows a pre-university student to graduate in two years and a career student in three.

Through the Centre for Students with Disabilities, students may enroll for a reduced course load without making a formal request if they indicate their need for this accommodation at the time of early registration. Non-disabled students must make a formal request to take a reduced course load and must justify the need for this. A reduced course load must include a minimum of four courses, or twelve hours per week, in order for the student to maintain full-time student status. Students with major functional disabilities (i.e., those students who qualify for funding from the MEQ) are permitted to take less than four courses, or twelve hours per week, and still receive all the benefits of a full-time student (e.g. if they are in a program they are not charged tuition fees although they are studying part-time.

The data indicate that students with disabilities who were enrolled as full-time students in diploma programs undertook a lighter course load in the first semester compared to their non-disabled peers. The average number of courses taken by students with and without disabilities, and the t-test results are shown in Table 7. The differences between the two groups in the number of courses taken in all diploma programs (0.65) as well as in the Social Science program (0.91) were statistically significant.

Table 7

Average number of courses taken in the first semester by students enrolled full-time in diploma programs (1990-2002)

Program	Score	Students with Disabilities	Students with No Disability	t-test	p =
All diploma programs	Mean SD *N	5.92 1.53 532	6.57 1.19 28,903	9.69 df=542	.000
Social Science only	Mean SD *N	5.61 1.39 269	6.52 0.86 13,769	10.75 df=272	.000

*Sample includes failure grades of zero.

3.6 Course Pass Rates – First Semester

Course pass rates were based on total grades (n=3385 for students with disabilities; n=210,037 for non-disabled students) and were calculated by dividing the total number of first semester courses that were passed by the total number undertaken for each group of students.

When all programs were considered, the difference in the pass rates between the two groups of students was not statistically significant. When the analysis was undertaken by sector of enrollment, there was no significant difference between students with and without disabilities in either the career or pre-university sectors. However, when only students in the Social Science program were considered, the percentage of courses passed for students with disabilities was significantly higher (80.5% vs 76.6%). The analysis undertaken excluded failure grades of zero. The results of the Chi-square tests used to compare the groups are shown in Table 8.

Table 8

A comparison of the percentage of courses passed **(excludes failure grades of zero).**

	Students with Disabilities	Students with No Disability	Difference (a-b)	ChiSq (df=1)	p
All Students					
Total grades	3,385	210,037			
Number of Passing Grades	2,748	169,120			
% Passed	**81.2%**	**80.5%**	**+0.7**	0.93	.334
Social Science					
Total grades	1466	84,639			
Number of passing grades	1180	64,874			
% Passed	**80.5%**	**76.6%**	**+3.9%**	11.91	.001
All pre-university programs					
Total grades	2544	149,739			
Number of passing grades	2049	120,504			
% Passed	**80.5%**	**80.5%**	**0.0%**	0.01	.933
All career programs					
Total grades	511	31,882			
Number of passing grades	434	26,643			
% Passed	**84.9%**	**83.6%**	**+1.3%**	0.68	.409

The results of the test including zero failure grades in the analysis would favor students with disabilities, as this group had a lower proportion of failure grades (3.3%) compared to the non-disabled group (5.2%). Although not shown here, the results of the analysis when failure grades of zero were included resulted in the same outcome.

3.7 Average Grades in the First Semester (includes failure grades of zero).

When the average first semester grades are plotted against high school grades (the SecV average) (Figure 1, Table 9), it is evident that the two variables are correlated.

Table 9

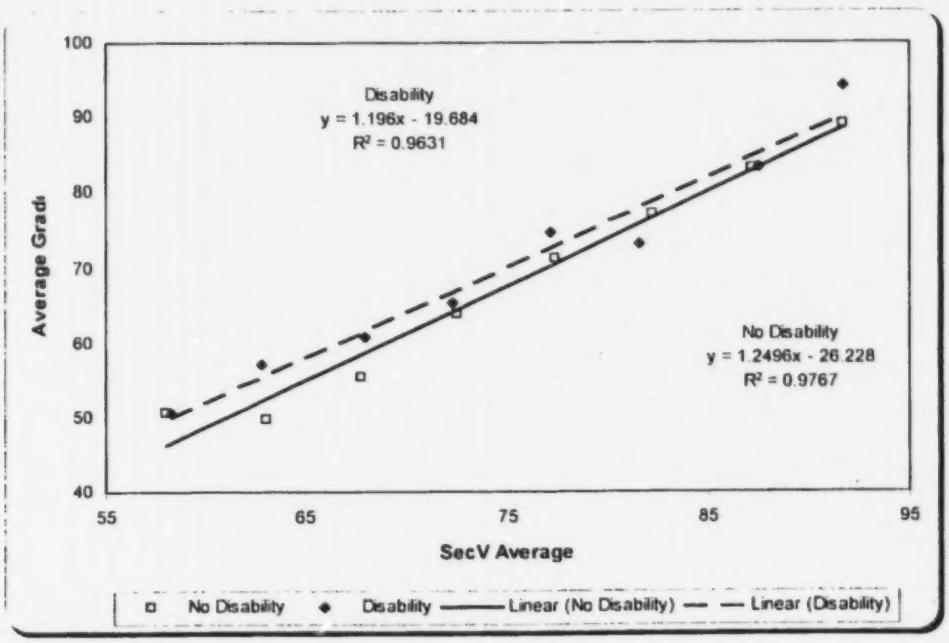
Average grades vs average SecV scores (excluding failure grades of zero).

	Students with Disabilities			Students with No Disability		
SecV Range	Number	SecV Grade	Grade Average	Number	SecV Grade	Grade Average
< 50	41	38	59	1770	37	59
>50<=55	4	51	62	254	52	61
>55<=60	14	58	51	583	58	51
>60<=65	58	63	57	2082	63	50
>65<=70	114	68	61	4629	68	55
>70<=75	136	72	65	5795	73	64
>75<=80	61	77	75	4656	77	71
>80<=85	39	82	73	2880	82	77
>85<=90	7	88	83	1367	87	83
>90<=95	6	92	94	371	92	89
95-100				16	96	85
Grand Total	***480**	**68**	**66**	**24403**	**71**	**66**

*Although 496 students had SecV averages, first semester grades were only available for 480.

Figure 1

Regression of SecV score vs grade average for students with and without a disability.



Since the SecV averages of students with disabilities tended to be lower than those of the non-disabled student population (Tables 4 and 5), one might have expected students with disabilities to have obtained lower average grades in cegep. To assess whether this was, in fact, the case, not only were the average grades compared for all students but the grade differences for students for whom a SecV average was available were also compared. Grades were compared for all students across all sectors. However, since performance may be related to the field of study, the scores of students in the first year of the Social Science program were also analyzed because all students were required to undertake similar courses, and the impact of field of study on grade averages is minimized.

All students across all sectors (including fail grades of zero). In Table 10 it can be seen that when the grades of all students were compared, regardless of the sector of enrolment, students with disabilities performed as well as their non-disabled peers. There was no significant difference between the average grades of students with and without disabilities ($F(1;41,634)=2.64$; $p=.104$).

Table 10

A comparison of the average grades of students with an without a disability in their first semester of study (1990-2002) includes failure grades of zero.

	Students with Disabilities			Students with No Disability			Test		
Group analyzed	**N**	**Average Grade (SD)**	**Average SecV Grade**	**N**	**Average Grade (SD)**	**Average SecV Grade**	**Difference in Average Grade (a-b)**	**F**	**p**
All sectors	634	**64.9 ±17.5**	n/a	41,002	**63.4 ±22.8**	n/a	1.5	2.64 (df=1; 41,634)	.104
Students with SecV scores	482	**64.4 ±18.0**	68.4	24,539	**64.5 ±20.1**	70.8	-0.1	.001 (df=1; 25,019)	.975
*With SecV as covariate (estimated marginal mean)	482	***65.9**		24,539	***64.4**		1.5	2.94 (df=1; 25,018)	.087
Social Science	270	**64.6 ±16.8**	n/a	14,031	**60.0 ±21.7**	n/a	4.6	11.88 (df=1; 14,299)	.001
Students with SecV scores	212	**64.0 ±17.6**	67.0	9,824	**60.7 ±21.1**	69.1	3.3	5.05 (df=1; 10,034)	.025
*With SecV as covariate (estimated marginal mean)	212	***65.4**		9,824	***60.7**		4.7	11.95 (df=1; 10,033)	.001

*ANCOVA - Univariate analysis of variance with SecV as covariate and estimated marginal means.

An ANCOVA test with the SecV score used as a covariate showed no significant difference between the two groups of students ($F(1;25,019)= 2.94$; $p=.087$). However, it can be seen in Table 10 that the marginal mean was higher for the group with disabilities when the covariate was taken into consideration, whereas the grades were nearly identical without correction for the covariate.

Social Science program (including failure grades of zero). When grades of the students with and without disabilities in the Social Science program were compared, the group with disabilities had significantly higher average grades compared to non-disabled students, even if no correction was made for the SecV average as a covariate. The results were compared using ANOVA and ANCOVA, and the test statistics are shown in Table 10. Students with disabilities performed better than might have been expected given their lower SecV entry scores.

3.8 Impact of Failure Grades of Zero on Average Grades

The sample of students with disabilities who registered through the College's Center for Students with Disabilities had the benefit of pre-registering in their desired courses and classes. In addition they were allowed to undertake a reduced course load. Consequently, these students may have had a lower tendency to abandon courses during the semester and incur a failure grade of zero.

In fact, the proportion of zero failure grades was higher for the non-disabled group (5.2%) compared to the group with disabilities (3.3%). Therefore, the overall average grade for the group with disabilities may be less distorted by this factor when compared to the non-disabled group. To investigate the effect of this factor on the performance of the two groups, the analysis described above was repeated when failure grades of zero were excluded. The results are shown in Table 11.

Table 11

A comparison of the average grades of students with and without a disability in their first semester of study (excluding failure grades of zero).

	Students with Disabilities			Students with No Disability			Test		
Group analyzed	**N**	**Average Grade (SD)**	**Average SecV Grade**	**N**	**Average Grade (SD)**	**Average SecV Grade**	**Difference in Average Grade (a-b)**	**F**	**p**
All sectors	632	**66.3 ±15.9**	n/a	40,262	**65.9 ±19.8**	n/a	0.4	0.29 (df=1; 40,892)	.589
Students with SecV scores	480	**65.9 ±16.3**	68.4	24,403	**66.2 ±17.8**	70.9	0.3	0.07 (df=1; 24,881)	.790
*With SecV as covariate (estimated marginal mean)	480	*67.3		24,403	*66.1	70.9	1.2	2.12 (df=1; 24,880)	*.145
Social Science	269	**66.0 ±15.2**	n/a	13,908	**62.3 ±19.0**	n/a	3.7	10.05 (df=)	.002
Students with SecV scores	211	**65.5 ±15.9**	67.1	9,758	**62.8 ±18.6**	69.2	2.7	4.36 (df=1; 9,967)	.037
*With SecV as covariate (estimated marginal mean)	211	*66.7		9,758	*62.8		3.9	10.58 (df=1; 9,966)	*.001

*ANCOVA - Univariate analysis of variance with SecV as covariate and estimated marginal means.

All students in all sectors (excluding failure grades of zero). It can be seen in Table 11 that when all grades for all sectors were considered, there was no statistically significant difference overall in the first semester grade averages for students with and without disabilities.

Social Science program (excluding failure grades of zero). Table 11 also shows that when grades of students in the Social Science program were compared, the grade average for the group with disabilities was higher than that of the non-disabled group whether or not SecV average was used as a covariate. The significant difference in the means when the SecV average was used as a covariate suggests that students are performing better than expected given their incoming average.

3.9 Impact of Gender on Average First Semester Grades

A series of 2 X 2 analysis of variance (ANOVA) and analysis of covariance (ANCOVA) comparisons were carried out to examine the relationship between sex and disability status (2 sex (male / female) X 2 disability status (with a disability / no disability)). For the ANCOVAs, the covariate was high school leaving average (SecV). Test results and the average grades of females are shown in Table 12a and those of males in Table 12b. The analyses were carried out excluding failure grades of zero.

Table 12a
Average first semester grades of females (excludes failure grades of zero).

	Students with Disabilities			Students with No Disability			Test		
Group analyzed	**N**	**Average Grade (SD)**	**Average SecV Grade**	**N**	**Average Grade (SD)**	**Average SecV Grade**	**Difference in Average Grade (a-b)**	**F**	**p**
All sectors	306	**69.4 ±14.8**	n/a	21,118	**68.3 ±18.5**	n/a	1.1	1.12 (df = 1; 21,422)	.290
Students with SecV scores	243	**69.4 ±15.2**	70.4	13,371	**68.6 ±16.7**	72.1	0.8	0.57 (df=1; 13,612)	.452
*With SecV as covariate (estimated marginal mean)	243	*70.3		13,371	*68.6	72.1	1.7	*3.06 (df=1; 13,611)	*.083
Social Science	110	**70.9 ±11.8**	69.1	7,347	**65.6 ±17.9**	70.8	5.3	9.62 (df=1; 7,455)	.002
Students with SecV scores	85	**71.5 ±11.7**	69.1	5,222	**66.2 ±17.3**	70.8	5.3	7.99 (df=1; 5,305)	.005
*With SecV as covariate (estimated marginal mean)	85	*72.5		5,222	*66.2		6.3	*13.27 (df=1; 5,304)	*.000

*ANCOVA - Univariate analysis of variance with SecV as covariate and estimated marginal means.

Table 12b
Average first semester grades of males (excludes failure grades of zero).

	Students with Disabilities			Students with No Disability			Test		
Group analyzed	**N**	**Average Grade (SD)**	**Average SecV Grade**	**N**	**Average Grade (SD)**	**Average SecV Grade**	**Difference in Average Grade (a-b)**	**F**	**p**
All sectors	326	**63.3 ±16.4**	n/a	19,144	**63.2 ±20.8**	n/a	0.1	0.02 (df=1; 19,468)	.877
Students with SecV scores	237	**62.4 ±16.5**	66.3	11,032	**63.2 ±18.8**	69.3	-0.8	0.44 (df=1; 11,267)	.509
*With SecV as covariate (estimated margin/al mean)	237	*63.9		11,032	*63.1		0.8	0.37 (df=1; 11,267)	.542
Social Science	159	**62.7 ±16.4**	n/a	6,561	**58.7 ±19.6**	n/a	4.0	6.43 df(=1; 6,718)	.011
Students with SecV scores	126	**61.5 ±17.1**	65.7	4,536	**58.9 ±19.3**	67.4	2.6	2.11 df(=1; 4,660)	.146
*With SecV as covariate (estimated marginal mean)	126	*62.2		4,536	*58.9		3.3	3.96 (df=1; 4,659)	*.047

*ANCOVA - Univariate analysis of variance with SecV as covariate and estimated marginal means.

3.9.1 All sectors

Grades for all sectors and all students. When grades for all students in all sectors were analyzed, the ANOVA results show only a significant main effect for gender (F(1;40,890) = 51.51, p=.000). Neither the disability status main effect (F(1;40,890) = 0.69, p=.407) nor the interaction (F(1;40,890) =0.36, p=.547) were significant. The means and post hoc tests in Tables 12a and 12b show that there were no significant differences between women with and without disabilities or between males with and without disabilities.

Grades for all sectors and all students who had a SecV average. The ANOVA results were very similar when the grades of only those students who had a SecV average were analyzed. Again, only the main effect for sex was significant (F(1;24,879) = 59.56, p=.000). Neither the disability status main effect (F(1;24,879) = 0.00, p=.999) nor the interaction (F(1;24,879) =1.00, p=.318) were significant. Again, the means and post hoc tests in Tables 12a and 12b show that there were no significant differences between women with and without disabilities or between men with and without disabilities.

Grades for all sectors and all students who had a SecV average when SecV average is controlled for. When scores were analyzed by covarying the SecV average (ANCOVA), the results and scores in Tables 12a and 12b once more indicate that females outperformed males

(F(1;24,878) = 35.18, p=.000). Neither the disability status main effect (F(1; 24,878) = 2.61, p=.106) nor the interaction (F(1; 24,878) =0.41, p=.524) was significant. Again, the means and post hoc tests in Tables 12a and 12b show that there were no significant differences between women with and without disabilities or between men with and without disabilities.

3.9.2 Social Science program

Grades for all students in the Social Science program. When grades for all students in the Social Science program were analyzed, the 2X2 ANOVA results show significant main effects for both gender F(1;14,173) = 41.53, p=.000) and disability status (F(1;14,173) =15.8, p=.000). The interaction was not significant (F(1;14,173) =0.32, p=.574). It can be seen in Tables 12a and 12b that women had higher grades than men and that students with disabilities had higher grades than non-disabled students. Post hoc tests in Tables 12a and 12b show that women with disabilities had better scores than non-disabled women. Similarly, men with disabilities had better scores than men with no disabilities.

Grades for Social Science students who had a SecV average. The ANOVA results were very similar when the grades of only those Social Science students who had SecV average were analyzed. Again, both the main effects for sex (F(1;9,965) = 44.79, p=.000) and for disability status were significant (F(1;9,965) = 9.26, p=.002). The interaction was, once more, non-significant (F(1;9,965) =1.18, p=.277). Means, standard deviations, and post hoc test results are available in Tables 12a and 12b. These latter show that, while women with disabilities had significantly better scores than non-disabled women, there was no significant difference between men with and without disabilities.

Grades for Social Science students who had a SecV average when SecV is controlled for. When grades were analyzed by covarying SecV grades (ANCOVA), the results and scores in Tables 12a and 12b once more indicate that females outperformed males (F(1; 9,964) = 30.80, p=.000), and that students with disabilities outperformed non-disabled students (F(1;9,964) = 15.78, p=.000). The interaction was not significant (F(1; 9,964) = 1.35, p=.245). Moreover, as can be seen in Tables 12a and 12b, both males and females performed better than expected given their lower SecV averages.

3.10 Course Success Rates

The course success rate is a measure of the percentage of students who passed 100% of the courses they attempted in the first semester. To calculate the success rate, only students enrolled full-time in DEC programs were included, as these students were taking close to the full course load requirements. The number of full-time students enrolled in DEC programs and the percentage of these students who passed 100% of the courses they attempted in the first semester are shown in Table 13. The analysis excludes failure grades of zero.

Table 13

Percentage of full-time students enrolled in DEC programs who passed 100% of the courses they attempted in their first semester (exclude failure grades of zero).

	Students with Disabilities		Students with No Disability		Test	
Sector	N	Percent Passing 100%	N	Percent Passing 100%	ChiSq (df=1)	p
Pre-university programs	458	47.6%	24,089	48.8%	0.25	.621
Career programs	72	59.7%	4,634	52.6%	1.45	.229
Social Science program	268	48.1%	13,657	41.4%	4.90	.027
All DEC programs	530	49.2%	28,723	49.4%	0.00	.950

It can be seen in Table 13 that in DEC programs, there was no statistically significant difference between students with and without disabilities with respect to the proportion who passed 100% of the courses taken in the first semester (ChiSq(1)=0.00, p=.950). This was true for both the career and pre-university sectors. However, in the Social Science program the course success rate for students with disabilities was significantly higher than that for non-disabled students (48.1% vs 41.4%).

3.11 Graduation Rates

Graduation rates were compared for pre-university and careers programs as well as for the Social Science program (the program in which the largest proportion of students enroll). Graduation rates by gender were also compared.

Pre-university programs. The average graduation rates for the commencing cohorts in pre-university programs between 1990-1998 are shown in Table 14. The latest cohorts for which the graduation rate in PrT2 and PrT were complete were A1998 and A2000, respectively.

Table 14

Average graduation rates for prescribed time (PrT), prescribed time plus two years (PrT2) and period of observation (PO) in pre-university programs. *

Cohorts (Autumn)	Disability Status	N	Number of Grads PrT	Number of Grads PrT2	%Grad PrT	%Grad PrT2	%Grad_ PO	Average Sessions to Graduation
1990-1998	Disability	269	41	134	**15.2%**	**49.8%**	55.0%	5.95
	No Disability	16,053	4,443	8,262	**27.7%**	**51.5%**	54.5%	5.24
1999-2000	Disability	98	26	n/a	**26.5%**			
	No Disability	3,667	1,409	n/a	**38.4%**			

*The bold line shows the boundary within which the graduation rates related to the measure is complete. The data for the 1999-2000 cohort is incomplete with respect to PrT2, as the students had not reached the session of study in which they were due to graduate.

The graduation rates were compared using Chi-square. There was a statistically significant difference between the two groups in graduation in prescribed time (ChiSq(1) =22.61, p=.000), but no significant difference in graduation in prescribed time plus two years (ChiSq(1) = 0.29, p=.591) or over the total period of observation (ChiSq(1)=0.03, p=.859). The group with a disability took longer to graduate (5.95 sessions) than the group without a disability (5.24 sessions) (t(8,891)=4.38; p=.000).

Career programs. The average graduation rates for the commencing cohorts in career programs between 1990-1997 are shown in Table 15. The A1997 and A1999 cohorts were the latest cohorts for which the graduation rates in PrT2 and PrT were complete. Students with a disability (8.24 sessions) took significantly longer to graduate than the non-disabled students (6.92 sessions) (t(1,417)=3.43; p=.001).

Table 1

Average graduation rates for prescribed time (PrT), prescribed plus two years (PrT2) and period of observation (PO) in career programs. *

Cohorts (Autumn)	Disability Status	N	Number of Grads PrT	Number of Grads PrT2	%Grad PrT	%Grad PrT2	%Grad_ PO	Average Sessions to Graduation
1990-1997	Disability	47	9	22	**19.1%**	**46.8%**	**53.2%**	8.24
	No Disability	2,694	874	1,334	**32.4%**	**49.5%**	**51.7%**	6.92
1998-1999	Disability	15	5	n/a	**33.3%**			
	No Disability	955	335	n/a	**35.1%**			

*The bold line shows the boundary within which the graduation rates related to the measure is complete. The data for the 1998-1999 cohorts is incomplete with respect to PrT2 as the students had not reached the session of study in which they were due to graduate.

Social Science program. When graduation rates in the Social Science program were compared, the pattern was similar to that for pre-university programs as a whole. Although there was a significant difference in the graduation rates in prescribed time (ChiSq(1)= 5.05; p=.024), there was no significant difference in PrT2 (ChiSq(1)=0.01; p=.918) or over the total period of observation (ChiSq(1)=0.16; p=.687). Results are shown in Table 16. Overall, students with disabilities took significantly longer to graduate (t(4,457)=2.54; p=.011).

Table 16

Graduation rates in the Social Science Program – Comparing students with and without a disability in prescribed time (PrT), prescribed time plus two years (PrT2) and the period of observation (PO).*

Cohorts (Autumn)	Disability Status	N	Number of Grads PrT	Number of Grads PrT2	%Grad PrT	%Grad PrT2	%Grad_ PO	Average Sessions to Graduation
1990-1998	Disability	152	19	67	12.5%	44.1%	49.3%	6.08
	No Disability	9,192	1,936	4,090	21.1%	44.5%	47.7%	5.46
1999-2000	Disability	55	14	n/a	25.5%			
	No Disability	1,802	569	n/a	31.6%			

*The bold line shows the boundary within which the graduation rates related to the measure is complete. The data for the 1999-2000 cohort is incomplete with respect to PrT2, as the students had not reached the session of study in which they were due to graduate.

Graduation rates by gender and disability status (pre-university programs). Due to sample size constraints this analysis was undertaken for pre-university programs only. The graduation rates for students in pre-university programs were compared by gender and disability status. These were averaged for the cohorts between 1990-1998 and are shown in Table 17. The graduation rates were compared for the three time periods PrT, PrT2 and PO.

Table 17

Graduation rates comparing males and females with and without a disability in pre-university programs (Cohorts 1990-1998).

Group	Gender	N	Number of Grads PrT	Number of Grads PrT2	%Grad PrT	%Grad PrT2	%Grad PO*	Average Sessions to Graduation
Students with a disability	F	123	26	73	21.1%	59.3%	62.6%	5.56±1.81
	M	146	15	61	10.3%	41.8%	48.6%	6.37±2.26
	Total	**269**	**41**	**134**	**15.2%**	**49.8%**	**55.0%**	**5.95±2.08**
Students with no disability	F	8743	2871	5029	32.8%	57.5%	60.2%	5.08±1.80
	M	7310	1572	3233	21.5%	44.2%	47.7%	5.48±2.12
	Total	**16053**	**4443**	**8262**	**27.7%**	**51.5%**	**54.5%**	**5.24±1.95**
Both groups	F	8866	2897	5102	32.7%	57.5%	60.2%	5.09±1.81
	M	7456	1587	3294	21.3%	44.2%	47.7%	5.50±2.13
	Total	**16322**	**4484**	**8396**	**27.7%**	**51.5%**	**54.5%**	**5.25±1.95**

Males tend to graduate at lower rates than females in each of the time frames considered (PrT, PrT2 and PO). This was true for both students with and without a disability. The differences in graduation rates between males and females over the period of observation were of a similar order of magnitude for both groups: 14% for students with disabilities compared to 12.5% for those without.

However, there was no significant difference between males with and without disabilities or between females with and without disabilities for graduation rates in PrT2 or PO. The Chi-square statistics are shown in Table 18. There were, however, significant differences for the PrT rates between males with and without disabilities as well as for the female comparison, and this is consistent with the earlier observation for the group with disabilities as a whole.

Table 18

Chi-square test statistics comparing graduation rates of students with and without disabilities by gender (pre-university programs).

Group compared	PrT		PrT2		PO	
	ChiSq (df=1)	p	ChiSq (df=1)	p	ChiSq (df=1)	p
Males vs females	263.72	.000	289.688	.000	255.31	.000
Males vs females with disabilities	6.10	.014	8.24	.004	5.27	.022
Males vs females without disabilities	255.45	.000	281.65	.000	250.36	.000
Males with vs males without disabilities	10.78	.001	0.35	.556	0.05	.819
Females with vs females without disabilities	7.55	.006	0.17	.684	0.30	.583

3.12 Time Taken to Graduate by Gender and Disability Status (Pre-university)

Due to sample size constraints this analysis was undertaken for pre-university programs only. A 2X2 ANOVA was conducted to compare the average time taken to graduate (measured in semesters) by males and females with and without a disability.

There was a significant main effect for disability status. Students with disabilities took 0.71 sessions longer to graduate than non-disabled students ($F(1;8,889)=18.00$; $p=.000$). There was also a significant main effect for gender ($F(1;8,889)=14.18$; $p=.000$). Males took 0.41 sessions longer than females to graduate. There was no significant interaction between gender and disability ($F(1;8,889)=1.58$; $p=.209$).

The difference between males and females in the time taken to graduate was 0.81 sessions for students with disabilities, compared to 0.40 sessions for those without. Results are summarized in Table 19.

Table 19

Differences in the average number of sessions to graduate: Males and females with and without a disability in pre-university programs.

Group compared	Difference
Males vs females	0.41
Males vs females with disabilities	0.81
Males vs females without disabilities	0.40
Males with vs males without disabilities	0.88
Females with vs females without disabilities	0.48
Students with a disability vs no disability	0.71

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Results: Success Indicators By Disability Type

3.13 Average Grades by Disability Type

The average grades for students by disability type are shown in Table 20. Students with more than one disability were included in the 'all other disabilities classification'. When average grades were compared by disability type (one-way ANOVA), there was a significant difference in the average grades between groups ($F(12;619)= 2.64$; $p=.002$).

Table 20

Average grade by disability type (all students and sectors of enrolment) (excludes failure grades of zero).

Nature of Disability	N	Average Grade	SD
Visual impairment - low vision	19	70.3	11.4
Visual impairment - blind	5	77.6	12.7
Mobility impairment - no wheelchair	13	71.1	9.7
Mobility impairment - wheelchair user	18	69.2	15.1
Mobility impairment - problem with arms and hands	6	70.3	11.7
Hearing impairment - oral approach	28	69.6	13.5
Hearing impairment - sign language user	15	62.8	16.8
Communication impairment	2	67.6	38.2
Learning disability / ADD	347	63.7	16.5
Psychiatric impairment	40	69.1	14.4
Chronic medical condition	71	70.2	15.0
Other impairment / disability	14	78.3	7.6
Multiple impairments / disabilities	54	67.0	16.7
Total	***632**	**66.3**	**15.9**

*Although there were 653 students with disabilities, only 632 had grades for the first semester.

Because the numbers of students in some of the disability classifications were small, the sample was grouped into those with learning disabilities/ADD (the largest group) and students with all other disabilities combined. The group with multiple disabilities was included with the students with all other disabilities. These two groups were compared to the non-disabled group.

All sector comparison. A one-way ANOVA comparison of the three groups (learning disability/ADD, 'all other disabilities,' no disability) showed a significant difference in average grades among groups ($F(2;40,891)=6.93$; $p=.001$).

Post hoc testing (Tukey HSD) showed that the students with learning disabilities/ADD had average grades (63.7%) which were significantly lower than the average for students with all other disabilities (69.5%) ($p=.001$). However, the grade average of students with learning disabilities/ADD was not significantly different ($p=.118$) from the average of non-disabled students (63.7% vs 65.9%). The students with 'all other disabilities' had a grade average that was significantly better than that of the non-disabled group ($p=.006$). Means and standard deviations for the three groups are shown in Table 21.

Table 21

Average first semester grades of 3 groups: students with no disabilities, students with learning disabilities/ADD, students with 'all other disabilities' (excludes failure grades of zero).

Program	Learning disability/ADD			'All other disabilities'			No disability		
	N	Average Grade	SD	N	Average Grade	SD	N	Average Grade	SD
All sectors	347	63.7	16.5	285	69.5	14.6	40,262	65.9	19.8
Social Science	166	63.6	15.8	103	70.0	13.3	13,908	62.3	19.0
Pre-university	273	63.9	15.9	188	70.3	14.4	24,745	65.7	18.7
Careers	32	64.0	19.4	40	70.8	12.2	4,634	67.0	16.7

Social Science comparison. When only students in the Social Science program were compared using one-way ANOVA, the pattern was similar to that for the all sector comparison. There were significant differences in the average grades for the three groups ($F(2;14,174)=8.69$; $p=.000$). Students with learning disabilities/ADD performed as well as students without disabilities ($p=.403$), and less well than students with all other disabilities ($p=.007$). Students with all other disabilities performed better than the non-disabled students ($p=.000$). Means and standard deviations for the three groups are shown in Table 21.

Pre-university and careers comparison. A 2X2 ANOVA was used to compare average grades by sector (pre-university and careers) and disability status (learning disability/ADD, 'other disabilities', no disability). The results showed a significant main effect for disability status ($F=2;29,906)=4.48$; $p=.011$). There was no significant main effect for sector ($F(1;29,906)=0.15$; $p=.696$). The disability status vs sector interaction was not significant ($F(2;29,906)=0.10$; $p=.908$).

Post hoc testing (Tukey HSD) revealed the same pattern as for Social Science and the all sector comparison. Students with learning disabilities/ADD performed as well as non-disabled students ($p=.137$). Students with all other disabilities performed better than either the group with learning disabilities/ADD ($p=.000$) or the group without disabilities ($p=.001$). Means and standard deviations are shown in Table 21.

3.14 Course Pass Rates by Disability Type

There was a significant difference in course pass rates between students with learning disabilities/ADD compared to students with all other disabilities (Table 22). Seventy-eight percent of the courses undertaken by students with learning disabilities/ADD were passed. This was significantly worse than the 85.1% for students with all other disabilities ($ChiSq(1)=24.87$; $p=.000$).

Table 22

Comparison of course pass rates by group (exclude failure grades of zero) (total grades = 3,385).

	Students with Learning Disability/ADD	Students with All Other Disabilities	Test		
			Diff a-b	ChiSq (df=1)	p
Number of course grades	1,950	1,435			
Number of passing grades	1,527	1,221			
% of passing grades	**78.3%**	**85.1%**	**-6.8%**	**24.87**	**.000**

3.15 Course Success by Disability Type

Course success comparisons were undertaken for students enrolled full-time in DEC programs. When compared to students with all other disabilities, a lower proportion of students with learning disabilities/ADD passed 100% of the courses they undertook in the first semester (43.4% vs 57.1%; $ChiSq(1) = 9.68$, $p=.002$) (Table 23).

Table 23

Percentage of full-time students enrolled in DEC programs who passed 100% of the courses they attempted in their first semester: Students with learning disabilities/ADD vs students with 'all other disabilities'(exclude zero fail grades).

Sector	Students With Learning Disability/ADD		Students With All Other Disabilities		Test	
	N	Percent Passing 100%	N	Percent Passing 100%	ChiSq (df=1)	p
Pre-University	272	41.5%	186	56.5%	9.84	.002
Careers	32	59.4%	40	60.0%	0.00	.957
Total DEC Programs	**304**	**43.4%**	**226**	**57.1%**	**9.68**	**.002**

The chi-square test results are summarized by sector of enrolment in Table 23.

3.16 Graduation Rates – Comparing Students with Learning Disabilities/ADD and Students with 'All Other Disabilities' in Pre-university Programs

When the disability classification was broken down, the cohort size associated with careers programs were too small for meaningful analysis. Therefore, the comparison of graduation rates for students with learning disabilities/ADD to those for students with all other disabilities was only done for pre-university programs (Table 24).

When compared to rates for students with 'all other disabilities,' there were no significant differences in graduation rates for students with learning disabilities/ADD PrT (ChiSq(1)=0.07; p=.799), PrT2 (ChiSq(1)=0.31; p=.799), or for the total period of observation (PO) (ChiSq(1)=0.03; p=.868), or in the time taken to graduate (t (146)=0.61; p=.546). The graduation rate comparisons are shown in Table 24.

Table 24

Comparison of graduation rates in pre-university programs for students with learning disabilities/ADD and students grouped into the 'all other disability' category.

Cohorts	Group	N	Number of Grads PrT	Number of Grads PrT2	%Grad PrT	%Grad PrT2	%Grad PO*	Average Sessions to Graduation
1990-1998	Learning disability /ADD	146	23	75	15.8%	51.4%	55.5%	5.85
	'All other disabilities'	123	18	59	14.6%	48.0%	54.5%	6.06
	No disability	16,053	4,443	8,262	27.7%	51.5%	54.5%	5.24
1999-2000	Learning disability /ADD	74	19	n/a	25.7%			
	'All other disabilities'	24	7	n/a	29.2%			
	No disability	3,667	1,409	n/a	38.4%			

Summary and Discussion

4.1 Summary Of Findings On Academic Outcomes

Students with and without disabilities were compared on four outcome measures: graduation rates, average grades in the first semester, course pass rates, and course success rates. For some analyses, students with disabilities were divided into two groups – those with learning disabilities and/or attention deficit disorder (ADD) and those with all other disabilities.

Overview. The findings indicate that students with disabilities at Dawson College had graduation outcomes that were virtually identical to those of non-disabled students. The main difference was that students with disabilities took, on average, approximately one semester longer to graduate. When average grades were examined, students with disabilities did at least as well as, and in some cases significantly better, than their non-disabled peers. When students with disabilities were divided into two groups, students with learning disabilities/ADD and students with all other disabilities, the overall trend was for students with learning disabilities/ADD to have similar or slightly poorer academic outcomes than the non-disabled sample, and for students with all other disabilities to have slightly superior outcomes. Males had poorer results than females on all indicators. This was true for both students with and without disabilities. All of these findings were incredibly robust, and remained consistent through a series of different evaluations of the constructs investigated.

Graduation rates. Overall, the findings indicate that students with disabilities at Dawson College had graduation outcomes that were virtually identical to those of non-disabled students. Although none of the comparisons were significant, in all instances the results of students with disabilities were slightly higher than those of non-disabled students. The graduation rates for students with learning disabilities/ADD were not significantly different from those of non-disabled students or those with all other disabilities. The only significant difference was that students with disabilities took, on average, approximately one semester longer to graduate. Females had better outcomes than males, regardless of disability status.

Average grades. When average grades were examined, students with disabilities did at least as well as, and in some cases significantly better, than their non-disabled peers. The overall trend was for students with learning disabilities/ADD to have similar or slightly poorer academic outcomes than the non-disabled sample, and for students with all other disabilities to have slightly superior outcomes which were significant for several comparisons. Females had better grade averages than males. This was true for both students with and without disabilities. Students with disabilities entered Dawson College with lower high school grades than students without disabilities; the analyses indicate that in some cases they performed better than would have been predicted by their incoming grades.

Course pass rates. Overall, all students passed approximately 80% of the courses for which they were registered in the first semester. Again, students with disabilities did at least as well as, and in some cases significantly better, than their non-disabled peers. Here, too, the overall trend was for students with learning disabilities/ADD to have similar or slightly poorer academic outcomes than the non-disabled sample, and for students with all other disabilities to have slightly superior outcomes which were significant for several comparisons.

Course success. The proportion of students enrolled in full-time diploma programs who passed 100% of their first semester courses was approximately 50% for the whole sample. Here, too, students with disabilities did at least as well as, and in some cases significantly better, than their non-disabled peers. Once more, the overall trend was for students with learning disabilities/ADD to have similar or slightly poorer academic outcomes than the non-disabled sample, and for students with all other disabilities to have slightly superior outcomes which were significant for several comparisons.

4.2 Summary Of Findings On Sample Characteristics

Data from the Dawson College records contained information on aspects such as sex, mother tongue, place of birth, age, incoming high school average and the program in which the student first enrolled. The data on these variables show both similarities and differences.

Demographics. There were several differences between the samples of students with and without disabilities. These include: (1) a larger proportion of the sample of students with disabilities was male while a larger proportion of non-disabled students was female; (2) students with disabilities were more likely than their non-disabled peers to have English as their mother tongue and (3) to be born in Canada or the USA than was the case for the non-disabled sample. All of these differences were statistically significant.

Academic preparation and choices. Students with disabilities entered Dawson College with significantly lower high school leaving averages (3% lower) than non-disabled students. They were more likely to enroll in pre-university and career diploma programs than non-disabled students, while the converse was true for continuing education. The most popular diploma program for the majority of students with and without disabilities was the pre-university Social Science program. In diploma programs, students with disabilities took, on average, approximately one less course per semester than their non-disabled peers.

Age. The mean age of students entering Dawson College diploma programs was between 18 and 19. There was no significant difference in the average age between students with and without disabilities in either pre-university studies or in career programs. Because students with disabilities were found to take approximately one additional semester to graduate, it is possible that they were older than non-disabled students when they graduated.

Students entering continuing education were substantially older than those entering diploma programs: between 25 and 28. There were relatively few students with disabilities in continuing education compared to non-disabled students. The continuing education students with disabilities were, however, significantly younger than the large number of non-disabled continuing education students. This resulted in the finding that, overall, at the time of enrollment, students with disabilities at Dawson College were somewhat younger than non-disabled students. This was due, primarily, to the larger proportion of older non-disabled students registered in continuing education courses.

Types of disabilities. By far the largest proportion of students with disabilities had a learning disability and/or attention deficit disorder (53%). This was followed, in rank order, by students with chronic medical conditions (14%), psychiatric (8%) and mobility impairments (8%), hearing impairments (7%), visual impairments (5%), difficulty using one's arms and hands (3%), and communication impairments (1%). Approximately 8% of the sample had multiple impairments. This 8% is likely to be an underestimation because it was the practice of the Center for Students with Disabilities to record only the "primary" disability or impairment as defined by the need for accommodations.

4.3 Limitations Of The Investigation And Generalizability Of The Findings

Although the samples of students both with and without disabilities are large and represent a 12 year span, there are several limitations of this investigation that must be considered in the interpretation and generalizability of the findings. Nevertheless, we do not believe that the overall pattern of the findings is in any way compromised.

a. The data were obtained at one institution only: Dawson College.

   Even though our data were obtained from only one college, data from other studies have shown similar results. For example, data from British Columbia's public colleges and institutes show that the GPAs of students with and without disabilities are virtually identical (2.94 vs 2.95, respectively), regardless of program attended (Outcomes Group, 1998). Reflective of our own findings, results from Gavilan College (2002) in the United States show that students with learning disabilities performed at or below the level of non-disabled students, while students with all other disabilities had somewhat higher scores. Nevertheless, large scale British studies have shown that academic outcomes of students with and without disabilities are equivalent only when differences in background variables, such as poorer high school grades, are taken into account (Richardson, 2001; Richardson & Roy, 2002).

b. The number of students who registered with the Center for Students with Disabilities is likely to be only a fraction of the total sample of students with disabilities at Dawson (Fichten, Asuncion, Barile, Robillard, Fossey, & Lamb, 2003; Office of Institutional Research, 2002).

   Some students with disabilities do not identify themselves to the Center for Students with Disabilities and are, therefore, considered to be part of the sample of non-disabled students. Given the large size of the sample of students without a disability, the inclusion of these students in the non-disabled group is likely to have only a very minor impact.

c. Record keeping practices of the Center for Students with Disabilities probably underestimate the number of disabilities each student had (cf. Fichten, Asuncion, Barile, Fossey, & Robillard, 2001).

   The underestimation of the number of students' disabilities in no way influences the overall performance of the sample of students with disabilities.

d. Given the retrospective, archival nature of the study, there are inevitably missing pieces of data. While this is true, this is true of both samples.

e. Except for graduation rates, we examined performance of students only in the first semester.

   Although we examined the performance of students only in the first semester, the graduation rate data, which reflect overall outcome across all semesters, shows results that are very similar to the other indices.

f. Students with and without disabilities were registered in different types of programs with different graduation rates and grade averages. While students with disabilities were more likely to be enrolled in diploma programs than were non-disabled students, most students, both those with and without disabilities, were enrolled in the Social Science pre-university diploma program. In addition to analyzing the outcomes of all students, we also analyzed outcomes for the large subgroup of students who were enrolled Social Science. Because course requirements for these students were similar, differences due to discrepancies in field of study were not likely to influence the results. When we did this, the results were more sharply focused to show the overall pattern, and many findings in favor of students with disabilities, that were not evident when "all students in all programs" were considered became significant.

g. The graduation rates reported will underestimate the true rate at which students graduate from college, since the figures do not account for students who may have left Dawson and completed their studies at another cegep.

   Although this is the case, there is no reason to assume that the proportions are different for students with and without disabilities.

Other indices which suggest that our results are valid include the following points.

In *Hypothesis 1*, we predicted that disability status will be an important variable when time taken to graduate is evaluated and that other success criteria, such as grades, would not be affected by having a disability. The findings confirm the first part of this hypothesis; the data show that it took, on average, approximately one semester longer for students with than students without disabilities to graduate.

The second premise of this hypothesis needs some clarification, however. We expected that students with and without disabilities would have similar success outcomes on most variables studied. Overall, this was, indeed, the case. When outcomes of all students with disabilities were evaluated, for the most part there was either no significant difference, or the difference was significant in favor of students with disabilities. The unexpected finding was that when we grouped students into those with learning disabilities/ADD and those with all other disabilities, the latter group outperformed non-disabled students on many indices.

In *Hypothesis 2* we predicted that there was reason to believe that students with learning disabilities/ADD may perform at a level different from students with other disabilities. We made no predictions about the direction of the difference. What our findings show is that students with learning disabilities/ADD had similar or slightly poorer outcomes than non-disabled students. Because they generally outperformed non-disabled students, students with disabilities other than learning disability/ADD also had better outcomes than students with learning disabilities/ADD.

Consistent with *Hypothesis 3*, individual factors that predict success for non-disabled students were found to be important predictors of success for students with disabilities as well. The same variables, such as sex and high school grades, which are known to influence performance in college, did so for both groups. The correlation coefficients between high school and cegep grades for the 2 groups (i.e.,.98 and.99) were virtually identical.

Similarly, consistent with *Hypothesis 4*, where we predicted that females would have better success outcomes than males, regardless of disability status, females outperformed males for both groups on all variables investigated. Consistent with findings reported by Henderson (1999) for American students entering postsecondary education, in our study, too, there were more male students with disabilities than females entering cegep for the first time. The present study's finding that women are more likely to graduate than men, regardless of disability status, is also consistent with findings of studies of graduates with disabilities from both the US (Horn, Peter, & Rooney, 2002) and Canada (Paju, 2000; Taillon & Paju, 1999).

In *Hypothesis 5* we predicted that students with disabilities would be over-represented in Social Sciences and in continuing education. The first part of this hypothesis was confirmed. The second part was not. Although the pre-university Social Science program was the most popular diploma program for all students, it was relatively more popular for students with disabilities than for students without disabilities.

Our findings also show that both students with and without disabilities were more likely to be enrolled in pre-university studies than in career programs. When only those students who chose diploma programs at Dawson were considered, there was no statistically significant difference in the proportions of students with disabilities (13.5%) and without disabilities (15.7%) who chose to enroll in the careers sector. Studies from community colleges in Canada show that students with disabilities are more likely to be enrolled in vocational rather than pre-university programs (Outcomes Group, 1999). The low proportion of Dawson College students in career programs (relative to pre-university) for both groups is likely to be a reflection of the program mix at Dawson College, which is biased toward pre-university programs of study. In addition, there are numerous differences between career programs in the cegep system and in many Canadian colleges. For example, in cegeps (1) vocational programs often have more demanding entrance requirements than pre-university studies, (2) take a minimum of three years to complete (i.e., at least one year longer to complete than pre-university studies), and (3) are very difficult to complete if students do not take the full complement of required courses each semester, in part because pre-requisite courses are often offered only in the fall semester. Also, (4) cegeps, which comprise the Québec public junior/community college system, are distinct from trade and vocational schools where students can enroll to learn a trade in a year or less.

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In the second part of *Hypothesis 5* we predicted that students with disabilities would be over-represented in evening continuing education courses that do not lead to a diploma. The data do not support this hypothesis. In fact, the converse was the case. We found that non-disabled students were more likely to be enrolled in continuing education courses than students with disabilities. Nevertheless, students with disabilities were more likely to take a lighter course load than non-disabled students in the same diploma programs. The fact that students with disabilities tended to take a lighter course load is consistent with other investigations which have shown that students with disabilities are more likely to study part-time (e.g., Richardson, 2001).

Other aspects of the study also suggest that our findings are valid. First, in many cases the findings from our study were replicated in the pre-university and the careers programs. Second, the proportion of students with different impairments resembles the overall North American pattern of the past decade (e.g., Horn & Berktold, 1999; Fichten, Asuncion, Barile, Fossey, & Robillard, 2001; Fichten, Asuncion, Barile, Fossey, Robillard, Judd, Wolforth, Senécal, Généreux, Guimont, Lamb, & Juhel, in press). Third, Dawson College's graduation rates are comparable to those of the public cegep network (Jorgensen, 2002). Fourth, findings on other aspects are consistent with the literature. For example, the present investigation shows that students with disabilities have poorer high school grades than non-disabled students. This is consistent with findings reported both in American (e.g., Horn & Berktold, 1999) as well as British studies (e.g., Richardson, 2001; Richardson & Roy, 2002). Fifth, students in the present investigation were more likely to be Canadian or US born and to have English as their mother tongue compared to non-disabled students. This too, is similar to findings showing that students with disabilities were less likely to be members of ethic minorities both in the United Kingdom (e.g., Richardson, 2001) as well as in America (e.g., Horn & Berktold, 1999).

A key departure from our findings is that most investigations have found that students with disabilities are older than their non-disabled peers (e.g., Amsel, & Fichten, 1990; Fichten, Goodrick, Tagalakis, Amsel, & Libman, 1990; Horn & Berktold, 1999; Richardson & Roy, 2002; Richardson, 2001). However, most such studies evaluated the age of students currently enrolled, while in the present investigation age data were collected at the time of initial enrollment. Since students in our sample typically took approximately one semester longer to complete their studies, they may have been older than their non-disabled peers had we surveyed them part way through their studies.

4.4 Why Do Students With Disabilities Perform So Well At Dawson College?

The academic outcomes of students with disabilities were similar to and in some cases superior to those of non-disabled students.

The literature has a variety of findings suggesting either that students with disabilities do almost as well as non-disabled students (Horn & Berktold, 1999) or that they do equally well (e.g., Outcomes Group, 1999), especially when scores are corrected for lower high school grades (Richardson, 2001; Richardson & Roy, 2002). We have only found one study which showed that students with disabilities do better than non-disabled students (Gavilan College, 2002). There are several hypotheses about why our findings show that students with disabilities perform so well at Dawson College.

Students are enrolled in a junior/community college and not a university. Most studies have examined performance at universities, rather than at junior/community colleges. It is possible that the requirements of universities, with their more academically challenging courses and greater workload, yield different results. Another possibility is that most of the large studies were conducted in England (e.g., Richardson, 2001, Richardson & Roy, 2002) and in the United States (Henderson, 1995, 1999, 2001; Horn & Berktold, 1999), where the postsecondary educational system, the definitions of disabilities, as well as the legislation governing accommodations for students with disabilities are different.

Only outstanding students apply to study at cegep. Another possibility is that only those students with disabilities who are very talented, have great study skills, and are especially highly motivated enter cegeps. As noted earlier, Québec has a substantially lower proportion of the postsecondary student body that is registered to receive disability related services than any other province in Canada, and Québec's rate is also considerably lower than that reported in most North American investigations (Fichten, Asuncion, Barile, Robillard, Fossey, & Lamb, 2003). Thus, the small number of students with disabilities in the overall sample suggests that this, at least in part, be correct.

The cegep environment, including the availability of disability related services, allows students to achieve at their potential. The "outstanding students" explanation above requires accounting for the lower high school entry grades of students with disabilities. Thus, either students with disabilities were underachieving in high school and/or they were over achieving at Dawson College. Both are possible. Disability related accommodations in high school may not be at an adequate level to allow students to achieve at their potential. Also, students in high school must take certain courses, including mathematics: math courses pose difficulties for many students, especially for those with learning disabilities and visual impairments. In addition, attitudes of high school students toward those who are different, including students with disabilities, are generally more negative than those of college students (cf. Fichten, 1988).

Another possibility is that students at Dawson College are provided with disability related services that allow them to maximize their potential. For example, allowing students with disabilities to pre-register permits them to select courses which they wish to take and which often fill up quickly at registration. This may mean the most excellent professors, courses which allow students to build on their strengths, and the most suitable timetables (e.g., no very long days, appropriate breaks between courses). Such factors may facilitate better performance.

Students with disabilities, because of the assistance received with registration, may as a group have had a diminished tendency to drop courses which would incur a failure grade of zero. This would favorably influence their overall grade average relative to non-disabled students. The data show that students with disabilities, as a group, were, indeed, less likely to incur a failure grade of zero. Nevertheless, the results continued to hold even when failure grades of zero were eliminated from the analyses. This suggests that the good performance of students with disabilities is not simply due to their being less likely to drop courses after the course drop deadline and incur failure grades of zero.

4.5 Conclusions, Recommendations, And Implications

The data do not permit us to choose among the alternatives above to explain the overall superiority of the academic outcomes of students with disabilities despite having lower high school grades at entry to Dawson College. Additional research needs to be carried out. Future studies can evaluate academic outcomes at other cegeps and examine the extent to which the present results are replicated. Also, students can be queried about the level and nature of disability related services that they received in high school and surveyed to determine perceived facilitators and obstacles to success in cegeps. An evaluation can also be made of the relationship between graduation rates of students with disabilities in high school and the nature of disability related services available to them. It is possible that it is the lack of services and accommodations in the high schools that result in the lower high school entry grades of students with disabilities.

The lower grades at entry to postsecondary education of students with disabilities was a feature of our sample as well as of most other studies in the literature (e.g., Richardson, 2001, Richardson & Roy, 2002; Horn & Berktold, 1999).

Crosby, Iyer, Clayton, and Downing (2003) argue that the policy of affirmative action in higher education and employment has more benefits than costs, both in achieving diversity and in achieving merit. Affirmative action has been defined as, "voluntary and mandatory efforts undertaken by federal, state, and local governments; private employers; and schools to combat discrimination and to promote equal opportunity in education and employment for all" (American Psychological Association, 1996, p. 2)." The goal of affirmative action is to eliminate discrimination and to redress the effects of past discrimination (Kravitz et al., 1997). The lower high school grades of the sample of students with disabilities in the present investigation, as well as in most published reports in the literature, suggests a case for affirmative action for students with disabilities in postsecondary education.

The sample we studied had access to disability related accommodations such as pre-registration, note taking services, interpreters, text and academic materials in alternate formats, additional time for exams if their disability warranted this, human assistants, as well as access to adapted computer facilities. Would they have done as well if these services were not available to them? The data do not permit us to say.

What the data do show, however, is that students who are registered to receive disability related services from their college can and do achieve good academic results. Should students with disabilities be encouraged to attend postsecondary education? Are the funds spent on supporting them in college well spent? Absolutely!

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Appendices

Appendix 1 Maximum Period Of Observation For Commencing Cohorts.

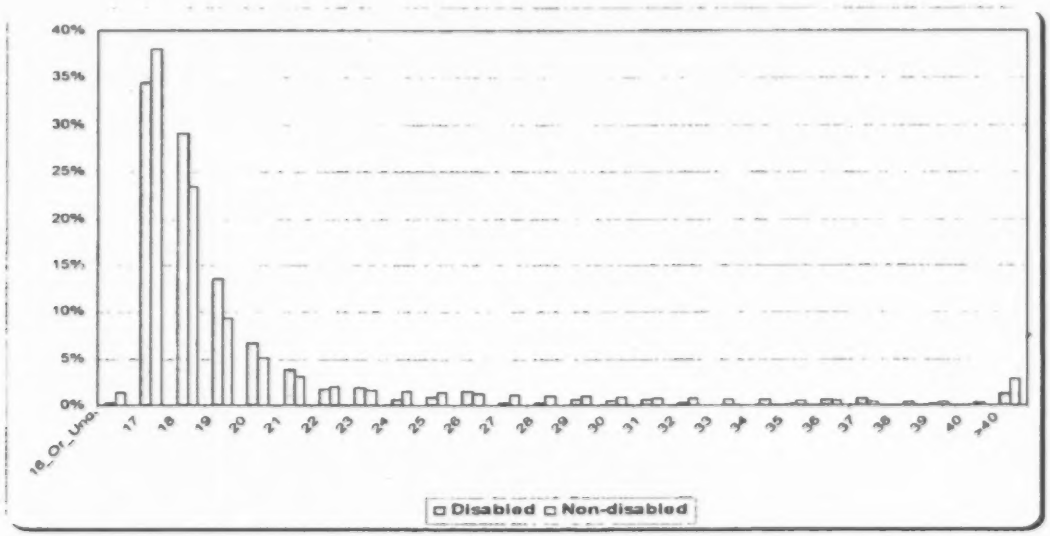
The maximum period of observation for commencing cohorts in May 2002, at the end of the Winter 2002 Session. (A=Autumn)

Cohort	Period of Observation (Semesters)
A1990	24
A1991	22
A1992	20
A1993	18
A1994	16
A1995	14
A1996	12
A1997	10
A1998	8

Appendix 2 Age Distribution Of First-Time Cegep Commencing Students

Autumn 1990 To Winter 2002

Age Category	Students with No Disability	Students with a Disability	Grand Total	% No Disability	Cumulative % No Disability	% Disability	Cumulative % Disability
<=16	585	2	587	1.4%	1.4%	0.3%	0.3%
17	15717	225	15942	38.0%	39.4%	34.5%	34.8%
18	9693	190	9883	23.4%	62.9%	29.1%	63.9%
19	3850	88	3938	9.3%	72.2%	13.5%	77.3%
20	2115	44	2159	5.1%	77.3%	6.7%	84.1%
21	1274	25	1299	3.1%	80.4%	3.8%	87.9%
22	831	11	842	2.0%	82.4%	1.7%	89.6%
23	647	12	659	1.6%	83.9%	1.8%	91.4%
24	627	4	631	1.5%	85.4%	0.6%	92.0%
25	553	6	559	1.3%	86.8%	0.9%	93.0%
26	523	10	533	1.3%	88.1%	1.5%	94.5%
27	469	2	471	1.1%	89.2%	0.3%	94.8%
28	402	2	404	1.0%	90.2%	0.3%	95.1%
29	391	4	395	0.9%	91.1%	0.6%	95.7%
30	351	3	354	0.8%	92.0%	0.5%	96.2%
31	324	4	328	0.8%	92.7%	0.6%	96.8%
32	289	2	291	0.7%	93.4%	0.3%	97.1%
33	257		257	0.6%	94.1%	0.0%	97.1%
34	244		244	0.6%	94.6%	0.0%	97.1%
35	217	1	218	0.5%	95.2%	0.2%	97.2%
36	225	4	229	0.5%	95.7%	0.6%	97.9%
37	173	5	178	0.4%	96.1%	0.8%	98.6%
38	160		160	0.4%	96.5%	0.0%	98.6%
39	152	1	153	0.4%	96.9%	0.2%	98.8%
40	127		127	0.3%	97.2%	0.0%	98.8%
>40	1161	8	1169	2.8%	100.0%	1.2%	100.0%
Grand Total	**41357**	**653**	**42010**	**100.0%**		**100.0%**	



Appendix 3 Phone Call Script.

Hi, my name is _____

I'm working with Alice Havel from Dawson College's services for students with disabilities.

We are conducting a follow-up study and your name appears on a list of students who pre-registered for courses through the service.

I would like to ask you two questions about your pre-registration, is that okay?

IF NO Thank you, Goodbye.

IF YES Did you pre-register through the service because you had a disability or special need?

IF NO Thank you, Goodbye.

IF YES From the list I'm going to read, please indicate which impairments or disabilities you had while at Dawson.

LIST

- Health / Medically related Impairments (e.g., diabetes)
- Psychological / Psychiatric
- learning disability / ADD
- Wheelchair user
- Mobility impairment
- Difficulty using hands / arms
- Deaf
- Hearing impairment / partially sighted
- Speech / Communication impairment
- Totally blind
- Visual impairment / partially sighted

Great! Thank you for your time, have a nice day.

QUESTIONS

Why do you want to know my disability?

- We're updating our files in order to be able to conduct some follow-up studies. We want to know the outcomes of students with disabilities so we're analyzing statistics and comparing course pass rates and graduation rates of students with disabilities.

If you need more information please do not hesitate to call Alice Havel at (514) 931-8731 ext. 1211.

Appendix 4 Breakdown Of Sample By Sector Of Enrolment

All Students (N = 42,010): First-Time Cegep Commencers At Dawson College A1990-W2002

Sector	Program	Students with Disabilities	Students with No Disability	Grand Total
Pre University	Creative Arts, Literature and Languages	129	4958	5087
	Fine Arts	13	411	424
	Liberal Arts	4	516	520
	Science	54	5111	5165
	Social Science	275	14161	14436
Pre University Total		**475**	**25157**	**25632**
Continuing Education Total		**54**	**9159**	**9213**
Careers	Business Administration	11	880	891
	Chemical Technology	1	68	69
	Civil Engineering Technology	0	75	75
	Community Recreational Leadership Training	11	213	224
	Computer Science Technology	11	586	597
	Diagnostic Imaging	1	70	71
	Electronics Technology	5	448	453
	Graphic Design	0	163	163
	Illustration and Design	5	242	247
	Industrial Design	0	56	56
	Interior Design	5	213	218
	Mechanical Engineering Technology	4	296	300
	Medical Laboratory Technology	1	121	122
	Nursing	2	322	324
	Office Systems Technology	1	304	305
	Professional Photography	5	220	225
	Professional Theatre	2	210	212
	Radiation Oncology	1	24	25
	Social Service	8	178	186
Careers Total		**74**	**4689**	**4763**
Preparatory	Accueil & Transition	50	2352	2402
Preparatory Total		**50**	**2352**	**2402**
Grand Total		**653**	**41357**	**42010**

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